

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILES 86/2

193 SCOMM 9: HOUSE SPEC. COMM. ON PERMANENT FUND 1977-78

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62. The interdependence of planning and budgeting requires that planning provide an adequate base for efficient budgeting. Elaboration of annual financial and other policies and programmes and costing of individual projects are to be done during the planning process. It is with respect to the costing of major projects that the record of planning has been usually poor. Development plans normally provide only a rough and broad magnitude of costs of major projects as a result of which detailed cost calculations, timing and phasing of such projects has to be worked out during the budgetary process. There is probably sufficient reason to believe that some of the major deviations in actual expenditures, compared with the original budget estimates, may be due to the inadequate preparation of major projects.

63. A factor which sometimes caused a divergence between the priorities embodied in national development plans and the projects included in a budget was the conditions of financing of projects suggested by some donor countries. In this connexion, the example of international aid-giving agencies, which generally extend financial assistance within the framework of national priorities, deserves serious consideration by all concerned to eliminate or reduce such divergencies.

64. A common weakness of budgets at various levels of Government is their lack of comprehensiveness and unity. There are generally two reasons for this state of affairs. Sometimes the implementation process is fragmented by the existence of earmarked funds. Some budgets do not reflect the relevant transactions of autonomous agencies or entities that are financially related to them. In either case, the unity of budget is impaired and the implementation process is somewhat constrained. To remove these weaknesses, budget formulation needs to be improved and budgets of different public authorities should, to the extent possible, include all transactions of a general government nature and, at least, over-all balances and investment expenditures of independent entities falling under their jurisdiction.

65. For a better co-ordination of planning and budgeting, the Governments of developing countries may consider the possibility of formulating multi-year, specifically biennial, budgets. To facilitate the preparation of sound budgets the feasibility of formulating annual or biennial plans also needs to be examined.

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66. Improving budget management is another objective to which greater attention needs to be paid. The system of programme and performance budgeting and the use of appropriate systems of budget classification are useful aids in this respect. Programme budgeting has been introduced in several developing countries. In many of them, however, it has not been fully linked to the requirements of planning. A programme budget should identify goals, objectives and specific actions and attempts to express these in quantitative terms as far as possible. Difficulties are sometimes encountered in the establishment of workload data and units of measurement but in respect of development outlay, conceptual and practical difficulties are not insurmountable. The link between programme budgeting and planning is strengthened when organizational and programme structures are in harmony. The Governments desiring to introduce programme budgeting have, therefore, to consider the needed organizational changes and also undertake appropriate measures for the development of the necessary skills and other administrative requirements.

W 67. The orientation of budget management to specific goals, objectives, programmes and projects evidently requires that financial management concepts and methods in accounting and auditing be tailored to programme needs. Accounting and auditing budget structure should be harmonized and appraisal of efficiency should receive greater emphasis in accounting and auditing than before. They should serve as tools of financial management and generate as much information on aspects of management as possible.

68. During the last decade, developing countries made significant efforts in raising financial resources through taxation. A large part of this gain in revenue was, however, absorbed by the rapid increase in current expenditures. As a result of this and the effect of inflation, levels of government savings have not displayed a buoyant growth. A scrutiny of increases in current expenditures has, therefore, attracted considerable attention in a majority of developing countries. The demand for public services evidently continues to increase and unit prices of providing services are also influenced by the rise in the general level of prices. There are also recurrent implications of completed capital facilities.

W 69. There are many difficulties in sharply distinguishing current and capital expenditures from each other. In developing countries, the criteria of asset formation cannot alone be taken as an adequate guide to make a neat and tidy distribution between current and capital expenditures. The developmental nature of certain expenditures, which are not commonly regarded as investments, such as on agricultural extension services, family planning, adult education etc., is now clearly recognized. There are also capital expenditures which are not necessarily of a developmental nature. Therefore, in an appraisal of "domestic effort" the difference between current revenue and "current" expenditure needs to be cautiously interpreted while awarding due priority to current expenditures of a developmental nature. There is thus a case for a scrutiny of increases in current expenditures and of some capital expenditures. This can best be done, first, within a comprehensive macro framework of analysis, and, secondly, at the micro level in respect of individual projects and activities.

W 70. Developing countries need to improve the quality and quantity of statistical data related to government budgeting. For example, full information is needed on government transactions and their impact on consumption, investment, income distribution and savings. There are several schemes of classifying government transactions, such as object classification, programme classification and economic and functional classification, on which international organizations have done considerable work. Developing countries could examine these schemes and develop appropriate models suited to local conditions.

(b) Tax administration

71. Appropriate measures for improving productivity of the sources of tax revenue in the financing of development need to be taken within the framework of national objectives. It is also desirable to relate reforms in tax administration to different economic and social conditions prevailing in developing countries.

72. The first consideration is the organization for tax administration. The reorganization of national tax offices, decentralization of operational functions and creation of new units for specific tasks are some of the important issues to be examined in this respect. Functional form of organization, as compared to separate branches for separate taxes, has the advantage of ensuring a built-in co-ordination and an integrated approach in the administration of various taxes. Decentralization of certain operations can aid significantly in mobilizing support of local authorities, thereby developing their capacity in the administration of taxes. Urgent major problems will require special and prompt attention and it may be advisable to establish special units to deal with such issues. It is equally essential to ensure timely preparation, processing and analysis of tax data. For this purpose, developing countries may wish to examine the feasibility of computer application for the processing of tax data.

73. Ability to collect taxes is largely influenced by the structure of an economy and the stage of its development. Given the economic and social conditions in developing countries, the task of collecting current taxes and tax arrears is rendered more complex and difficult than in developed countries. There are numerous ways in which collection effort can be improved. Examples include reducing unessential and/or unproductive workload for the tax authorities, placing payment of taxes on an automatic basis, encouraging voluntary tax compliance, introducing a system of self-assessment, "pay as you earn" (PAYE), estimated tax payment plans and, where feasible, collecting taxes through the banking system. The relevance of these or similar other measures needs to be examined in relation to the national conditions. International organizations can provide technical assistance to developing countries in this field in accordance with national needs and conditions.

74. The problems of tax avoidance and evasion are quite serious in many developing countries and, in fact, have assumed alarming proportions in some of them. Apart from the popular use of the amnesty device, Governments have enacted a variety of other measures, but many of these with unpromising effects. In part, the dramatic size of the problem is due to the inadequate strength of the political will in some countries to deal firmly with these issues. The situation is obviously compounded by the shortage of trained personnel, defective tax legislation, and weak tax administration. In some countries, certain economic policies to regulate particular economic activities might add to evasion and avoidance of taxes.

75. It is important to develop an integrated approach to reforms in tax policy, tax structure, and tax administration. There is a significant capacity for feedback among them which needs to be constantly encouraged and developed. Tax administration should not be oblivious to the economic and social objectives and effects of taxes levied, but should continuously undertake an evaluation of revenue and economic effects of tax rates, allowances, reductions, exemptions, and tax incentives and monitor changes in tax bases.

(c) Financial institutions

76. There is a wide range of financial institutions which exist in developing countries. These include commercial banks; government financial agencies; pension,

provident and social security funds; post-office savings banks; co-operative societies; insurance companies; unit trusts; national development banks; agricultural finance institutions; mortgage banks etc. At the regional level, there are regional development banks and at the international level, a number of international financial institutions. The Meeting noted with appreciation the accelerating efforts of developing countries to increase economic co-operation among them and the measures contemplated in this context to establish special financial institutions.

77. Financial institutions have a major role to play in the mobilization and allocation of financial resources. They will also have to assume new tasks as developing countries take measures to implement the New International Economic Order. For these reasons, there is an urgent need to create new and appropriate financial institutions, both of a general and specialized nature. The management and the over-all performance of the financial institutions has to be improved by taking suitable measures including a revision of relevant financial legislation where this is deemed necessary. Finally, monetary and credit policies, when they act as constraints on the working of financial institutions, should be suitably modified.

78. Relatively speaking, the allocative task of financial institutions merits greater attention than their mobilization effort. In addition to creating new specialized institutions in harmony with a national pattern of resource allocation, developing countries need to pay special attention to their interest rate policies which have a particular relevance to canalizing the resources of financial institutions into priority areas of investment.

79. Although Governments in developing countries have set up a number of financial institutions, these institutions have not always been successful in mobilizing domestic financial resources. They have relied substantially for their financial support on the Governments and on the external sector. Governments should undertake appropriate measures to encourage these institutions to improve their performance. For example, they could be authorized in appropriate cases to issue their own deposit obligations and to fashion suitable financial instruments which would reflect the preferences of various groups of savers. In the mobilization effort, particular emphasis needs to be placed on increasing the supply of available resources.

(d) Concluding remarks

80. The critical problems identified in the preceding paragraphs require research and action both at the national and international levels arriving at practical solutions for urgent problems in developing countries. Among the major subjects in this connexion may be mentioned the following:

- (i) Models and methodologies for multi-year budgeting to improve development planning;

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- (ii) Measures for improving accounting and auditing systems for managerial accountability and economic analysis purposes;
 - (iii) Issues in taxation for development, such as tax incentives for investment and employment, economic controls and tax avoidance and evasion, indicators for tax assessment, and "price-elasticity" of taxation;
 - (iv) Use of financial institutions' resources by income classes of recipients and by economic activities in relation to economic and social targets;
 - (v) Effects of interest rates and other financial policies on allocation of resources of financial institutions.

VI. CRITICAL AREAS FOR IMPROVEMENT: PUBLIC ENTERPRISES

81. Public sector enterprises show a great variety in their organization and activities. Developing countries use them to manage many kinds of development programmes and projects, particularly those involving public utilities, transport, manufacturing and resources development. Public enterprises may be organized as corporations, authorities, joint ventures or co-operatives. These differences notwithstanding, in many cases, the public sector enterprises constitute a major channel for implementation of development plans. The use of public sector enterprises is likely to pick up more momentum as the Programme of Action on the Establishment of a New International Economic Order gets under way.

82. The International Development Strategy calls upon the developing countries to improve the efficiency of public enterprises so that they make an increasing contribution to the achievement of social and economic objectives and to the production of surpluses for purposes of investment. At the present time, only scanty data are available on the contribution of public sector enterprises to investment resources. The information on productivity and efficiency of public sector enterprises is also negligible. The contribution that public enterprises can make to the financing of development is valuable and ought to be increased. The Meeting suggested that the efficiency and effectiveness of the public enterprises be enhanced so that, while fulfilling their socio-economical role, they make optimum use of the resources placed at their disposal. It is important in that respect for Governments to make explicit the contribution expected of public sector enterprises to national goals. Major relevant issues can then be considered within this framework. Some of the important issues are determination of financial policies and targets, capital structure, cost reduction devices including audits, marketing, management, and optimization of capacity.

83. It is imperative to ensure that the activities of public enterprises as they spread, do so in the mainstream of national planning and development and in the framework of public accountability. This is facilitated, in the first place, by programming their activities in the preparation of development plans and, secondly, by instituting arrangements for central co-ordination and monitoring of their implementation. In the latter case, it is evident that several options are available and, in fact, are used by the Governments. The choice of any particular

arrangement or of a judicious combination of them can only be determined at the national level in the light of local conditions. The evaluation of various national arrangements would also provide useful guidance in this respect.

84. However, the major responsibility for taking appropriate actions for internal management must rest with the enterprises themselves. They should make further and vigorous efforts to improve their decision-making processes and structures, modernize their financial management methods and procedures, increase the supply of trained manpower, extend the application of modern techniques of management, and establish arrangements for comprehensive evaluation of their performance. Attention also needs to be given to participatory management in enterprises. In this connexion it would be useful to undertake co-operative or cross-cultural research on different models of participation of workers in management.

85. The issues mentioned above and others like them offer opportunities for international exchange of experience and formulation of new and innovative approaches to public organizational means to achieve economic and social goals. For this purpose, consideration should be given to strengthening research on public sector enterprises.

VII. RESEARCH IN PUBLIC ADMINISTRATION AND FINANCE

86. During the 1950s and 1960s, the emphasis in the developing countries was on building and strengthening public administration and financial infrastructures and training of administrative and managerial personnel. Although there was a growing recognition of the importance of research in public administration and finance, it was not possible in many countries to allocate the necessary resources, including qualified personnel, to carry out the task. Institutions for carrying out research were also either non-existent or weak.

87. More and more developing countries are showing interest in developing public administration and financial doctrines and practices which are squarely based in their social and political realities. They want their educational and training programmes to use materials which are relevant to the same realities. Administrative reform programmes are also creating a demand for research in public administration. The countries are particularly keen for promoting research that is practical and oriented to solving specific problems.

88. To meet these needs, developing countries must give greater attention to measures for activating research in public administration and finance. Institutes of public administration, professional associations (national as well as transnational) and academic institutions should be encouraged and equipped to undertake research and disseminate their findings. Research should best be undertaken by people who are familiar with the socio-economic realities of the countries concerned. For this reason, developing countries need to give greater attention to the training of researchers. In order to improve further the quality of research, it is important to involve practitioners in such activities.

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89. A major problem in the field of public administration research has been access to information in government files and records. There is no systematic information available on policies pursued by different Governments in this regard. While it is not feasible for it to lay down general guidelines on the subject, the Meeting felt it desirable for all concerned to make available information necessary for the promotion of meaningful research in public administration. There is also a need to generate or systematize empirical information on certain aspects of public administration. Examples include census of public service employees, cost of public administration, and productivity of public services. Availability of such information is indispensable for realistic improvements in public administration, and eventually, perhaps for developing criteria for appraisal of administrative systems.

90. Regional centres in public administration and finance have an important role to play as a base for documentation and clearing-house activities. Such regional centres could also promote research that is more comparative in nature. It was also desirable in that area to promote consultation and communication so that duplication of work would be avoided and so that research results could be more widely shared and disseminated. As a further enrichment, cross-cultural research should also be encouraged.

91. Professional associations of practitioners and scholars in public administration and finance provide another avenue for collection, analysis and dissemination of useful information. Such associations are now in existence in many countries. There are regional and international professional associations which can play a particularly important role in promoting regional and cross-cultural exchange of information on public administration and finance.

92. A lot of information has been generated by technical assistance projects and programmes which should be used for purposes of research and should therefore be made available to researchers. This should also be the case for information generated by government review commissions. The Meeting recommended that technical assistance projects should have a research component. As many sources of information as possible should be tapped for research.

VIII. PROPOSED PROGRAMME OF ACTION UNDER THE INTERNATIONAL DEVELOPMENT STRATEGY

93. Many developing countries were able to achieve only partial fulfilment of their economic and social objectives during the first half of the Second United Nations Development Decade. One of the limiting factors in this regard was the degree of adequacy and effectiveness of their public administration and finance systems for development as revealed by the present review.

94. In order to accelerate economic and social development in the second half of the current Development Decade and to fulfil further responsibilities under the Programme of Action for the Establishment of the New International Economic Order, developing countries need to take purposive and prompt action to improve their

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public administration and finance capabilities for development. International organizations should make far greater efforts to help them in this task. In both cases, activities for improving public administration and finance capabilities should include concrete measures which are directly related to requirements of development generally and of the International Development Strategy for the Second United Nations Development Decade and the Programme of Action for the New International Economic Order specifically.

95. The public administration objectives for the Second United Nations Development Decade approved by the Economic and Social Council in its resolution 1567 (L) and the provisions on public administration and finance contained in General Assembly resolution 2626 (XXV) remain valid as guidelines for action but need to be rendered more explicit. Accordingly, the Meeting recommended the following measures for consideration by developing countries and international organizations.

96. To ensure timely action for formulating and implementing development plans, developing countries are requested, among other things, to give special attention to increasing the managerial capabilities of their public administration and finance systems so as to improve the effectiveness, efficiency and accountability of these systems. For this purpose, they are requested to consider specific steps such as:

(a) Relating public administration and finance improvement measures directly to requirements of national development plans and programmes, as well as to social objectives;

(b) Ensuring adequate supply of trained personnel, especially managerial, scientific and technical for the administration of development by formulating and implementing government-wide policies for manpower planning, education, training and research in public administration and finance;

(c) Ensuring that effective performance of public enterprises contributes to policy objectives of the Government, including mobilization of resources.

(d) Developing budgetary and financial systems and internal and external auditing for effective plan implementation and evaluation;

(e) Rationalizing and adjusting tax administration to changes in tax policy and tax structures and reorienting it to the needs of national objectives;

(f) Establishing new financial institutions as required and taking appropriate measures to increase their contribution to national goals and objectives;

(g) Forecasting public administration and finance requirements for the next 10-15 years and formulating necessary measures for their realization.

97. Pertinent United Nations research activities should be further oriented towards the public administration and finance requirements of the International

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Development Strategy and the New International Economic Order. Consideration should also be given to increasing the quantum and substantive scope of technical assistance to developing countries which should be encouraged to relate requests for such assistance to their national development plans specifically and to the International Development Strategy and the New International Economic Order generally. The Meeting recommended that the revision of the Strategy for the second half of the Second Development Decade should incorporate in it measures along the lines proposed above to assist the developing countries to carry these or similar measures more appropriate to national requirements and situations, and to promote greater support by the international community.

98. The Meeting further urged the United Nations to pay special attention to the public administration and finance requirements of the developing countries in the light of the decisions of the forthcoming special session of the General Assembly on implementation of the Programme of Action for the New International Economic Order. It also recommended preparations for anticipating the public administration and finance requirements of developing countries over the next 10 or 15 years so that timely action could be taken to meet them. Such requirements should be determined in consultation with developing countries. The requirements should be formulated in specific terms, as far as possible, to provide the basis for concrete action by the countries concerned and supporting measures by the international community.

Part Two. UNITED NATIONS PROGRAMME IN PUBLIC ADMINISTRATION AND FINANCE

IX. UNITED NATIONS PROGRAMME

Programme organization

99. The Meeting was informed, as noted earlier, that the current responsibilities of the Division of Public Administration and Finance of the Department of Economic and Social Affairs covered two closely related subprogrammes. These were (a) public administration; and (b) government budgeting and financial institutions. These subprogrammes had been assigned to two separate divisions in the Secretariat before 1974. The Programme in Public Administration had been the responsibility of the Public Administration Division. Activities relating to Government Budgeting and Financial Institutions had been part of another Programme looked after by the Division of Public Finance and Financial Institutions.

100. The Meeting noted that the reorganization of the Department of Economic and Social Affairs in 1973-1974 organizationally joined these two clusters of activities in one division, the Division of Public Administration and Finance. However, within this enlarged and integrated programme, two separate subprogrammes were to be retained for the time being - one for public administration and the other for public finance - for purposes of the programme budget of the Organization.

101. The Meeting commended the Secretary-General for these reorganization measures, viewing them as desirable steps towards increasing the effectiveness of the United Nations efforts to assist the developing countries in increasing their

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administrative capabilities for implementation of development plans and programmes. Financial administration and public administration are an integral part of administration for development. In fact, budgeting, expenditure control, accounts and audit, to mention only a few subjects in financial administration, are indispensable management tools for administration of development plans and programmes. Similarly, budgetary processes are frequently the most important vehicles for administrative improvement. For all these reasons, the Meeting strongly recommended the substantive integration of the two subprogrammes to implement fully the reorganization measures.

102. The Meeting was further informed that a number of measures had been taken to improve the management of the programme as recommended by the Administrative Management Service. As a result of these measures, the programme was now divided into five major substantive components:

- (a) Personnel administration and training;
- (b) Organization and management services;
- (c) Management of development programmes;
- (d) Government budget and financial management; and
- (e) Development of financial institutions.

The Meeting strongly endorsed these measures, which would help the Division to improve both its substantive support of technical co-operation projects and research and development activities. The Meeting was pleased to note the increasing recourse to the task-force approach within the Division in implementing its Programme.

Technical co-operation

103. A major part of the work of the Programme in Public Administration and Finance is the provision, upon request, of technical assistance to developing countries. The Meeting noted with satisfaction that the technical co-operation programme had continued to grow during the period under review. The substantive scope of the programme had also grown as a result of varying needs of developing countries for assistance from the United Nations.

104. Now that the public administration and financial management activities at Headquarters have been organizationally joined in the Division of Public Administration and Finance, the Meeting recommended that future country projects of technical co-operation, whenever feasible, should cover both these aspects to increase the effect of assistance. Also, the Division should inquire from developing countries having parallel technical co-operation programmes in these two aspects of public administration about the desirability of bringing them together in appropriate cases.

activities. These institutions represent a major breakthrough for regional co-operation among developing countries. The Meeting strongly supported the establishment of such institutions and requested UNDP to extend the necessary technical and financial support to them as provided for in General Assembly resolution 2845 (XXVI).

109. These institutions have a major role to play in supplementing the public administration and finance training, research and consulting facilities available nationally. They have a particularly important role in providing opportunities to senior administrators to acquaint themselves with the latest developments in public administration and to exchange experiences of common interest. They could also undertake research on administrative arrangements relating to problems in regional and interregional co-operation.

110. It was noted that public administration programmes in regional commissions had remained small or had even declined, in spite of recommendations of the Second Meeting to the contrary. While some of the activities previously carried out by them can now be undertaken by regional or subregional institutions, the Meeting believed that there was a continuing need for building and strengthening public administration and finance programmes in regional commissions. The nature and scope of these programmes should be determined by taking into account regional needs and the role of regional centres mentioned in preceding paragraphs, and the activities of the two should be properly co-ordinated. The Meeting further recommended strengthening of the staff resources for public administration and finance programmes in regional commissions. (of the UN?)

111. The Meeting expressed concern that the number of interregional seminars in public administration and finance had declined in spite of the recommendations of the Second Meeting that they be continued and intensified. The interregional seminars are an important vehicle of technical co-operation as they enable senior national officials to obtain and exchange information and experiences as a basis for formulating national policies on key administrative problems. They are also most useful in promoting international co-operation for development. The Meeting strongly urged the United Nations Secretariat and UNDP to give sympathetic consideration to proposals for the holding of interregional seminars.

112. Another area which deserves special mention is that of interregional advisory services. They serve a critical need in many developing countries which may not need long-range technical assistance, but require highly specialized or immediate short-term assistance. It is therefore important to continue and strengthen the programme of interregional advisory services in major substantive components of public administration and finance.

113. In addition to interregional activities, it is important to organize seminars and advisory services at the regional and subregional levels for focusing on problems and experiences uniquely pertinent to those levels, and for promoting regional co-operation. The Meeting recommended intensification and augmentation of regional and subregional activities in public administration and finance, and allocation of necessary resources for the purpose. It further recommended promoting

105. The Meeting took note of certain emerging trends in technical co-operation and urged their reinforcement. These included:

(a) The growing number of requests for institution-building projects which required a longer period for their gestation and maturity;

(b) The higher rate of growth of multifaceted comprehensive projects than of single-faceted projects;

(c) Greater interest on the part of developing countries in developing public administration systems and practices especially suited to their milieux; and

(d) Acceptance of the concept of continuing education and training in public services and consequent request for assistance in developing high-level institutions to meet the management development needs of senior administrators.

106. The country programming procedures extant for UNDP assistance, under the system of indicative planning figures, should be used by developing countries to plan their technical assistance requests in public administration and finance more systematically and to relate these to national needs for planning and plan implementation. In this context, it is also desirable to include public administration and financial management components in technical co-operation activities concerned with major development sectors, programmes and projects. This can be achieved through better co-ordination between technical co-operation projects in public administration and finance, where in existence, and technical co-operation projects in sectoral and programme areas. In other cases, consideration should be given to inclusion of public administration and financial management experts in technical co-operation projects in major sectoral and programme areas.

107. A critical factor in the success of technical co-operation programmes is the quality of experts assigned to them. It is, therefore, important to recruit the most qualified experts available. Moreover, as the number of qualified persons who could be considered for expert posts is growing in developing countries, every effort should be made to increase their percentage in technical co-operation projects. Whenever possible, recruitment of experts from within the region should be encouraged.

108. Developing countries have also shown a keen interest in the establishment of regional or subregional institutions of development administration. The African Centre for Training and Research (CAFRAD) and the Central American Institute for Public Administration (ICAP) have been in existence for several years. The Asian Centre for Development Administration (ACDA) started operations in 1973. The East African Community Management Development Institute came into existence in 1974. The Latin American Centre for Development Administration was organized in 1972 and applied for UNDP assistance in the same year. There have been proposals for the establishment of a similar centre for the Middle East. Also noteworthy is the International Centre for Public Enterprises in Developing Countries recently inaugurated in Yugoslavia; and many developing countries have expressed interest in sharing responsibility for maintaining the Centre and participating in its

a co-operative network of relevant institutions at various levels - national, subregional, regional and interregional - to carry out training, research and advisory activities most suitable and economical for that level and collaborating with other levels in programmes which could best be implemented at those levels.

114. The Meeting noted that while the Division had done a creditable job in providing substantive support to technical co-operation projects at various levels, its resources were being strained and spread thinly. As the magnitude and substantive spread of technical co-operation projects grow further, there will be additional demands for substantive support services. The Meeting emphasized the need for keeping the substantive support services adequate and commensurate with the growing size and complexity of the technical co-operation programme.

Programme of the Division of Public Administration and Finance
in research and development

115. In addition to providing substantive support for technical co-operation projects, as discussed in the previous section, the Division is responsible for research and development activities in public administration and finance. As the two subprogrammes of public administration and finance were joined organizationally only in 1974, their present work programmes had evolved separately.

116. The Second Meeting of Experts on the United Nations Programme in Public Administration held in 1971 had recommended a much larger programme of research and development (E/4950) than was actually carried out by the Division. The Meeting was informed that the work programme proposed by the Second Meeting was reviewed by the Committee on Programme and Co-ordination and the Economic and Social Council in 1971 and again in 1973. In 1971, CPC proposed and the Council agreed that the Division should not undertake certain projects recommended by the Second Meeting (for example, legal and judicial administration; ethical standards in the public services). In reviewing the programme again in 1973, CPC believed that, given the limited resources at the disposal of the Division and the heavy requirements for providing supportive services to the operational field programme, it had over-extended itself. In drawing up the future programmes, the Committee recommended that efforts be made to concentrate on fewer activities of greater relevance and urgency. The Committee requested that these views should be drawn to the attention of the Third Meeting of Experts to be held in 1975. Subject to these observations, the Committee recommended approval of the proposed work programme of the Division for 1974-1975. Accordingly, the work programme implemented by the Division during 1971-1974 was smaller than that recommended by the Second Meeting.

117. The public finance subprogramme of the Division did not have a comparable expert group to propose and review its activities. Instead, the activities were derived from various resolutions of the General Assembly and the Economic and Social Council. The present Meeting, therefore, did not have the kind of yardstick for the public finance subprogramme as it had for application to the public administration subprogramme. None the less, it believes the above comments mutatis mutandis also apply to the Division's public finance subcomponent.

118. The Meeting fully shared the views of CPC and believed that the Division should concentrate on fewer activities of direct and greater relevance to development. In reviewing the past performance of the programme, the Meeting found that most of the Division's activities in this category were devoted to exchange of information and research in support of technical co-operation projects. These activities in the work programme are highly desirable and should be continued. In fact, these ought to be intensified, albeit with a changed focus, to publicize research findings widely and improve substantive support of technical co-operation projects. In addition, however, there is an urgent need for strengthening and reorienting the research and development programme of the Division for carrying out the mandates established by the legislative bodies and for developing policy proposals for their consideration. In the opinion of the Meeting, the Division should, for example, develop proposals for consideration by legislative bodies on subjects such as:

(a) Specific measures in public administration and finance for achieving the objectives of the revised International Development Strategy for the Second United Nations Development Decade; ?

(b) Public administration and finance measures to implement the Programme of Action for the New International Economic Order; and ?

(c) Feasibility of forecasting public administration and finance requirements for the decade of the 1980s and of preparing necessary groundwork for formulating appropriate plans and programmes. //

Medium-term plan, 1976-1979

119. The Meeting reviewed the medium-term plan for 1976-1979. It was informed that the Division had already submitted its biennial work programme and budget for 1976-1977 and the medium-term plan for 1976-1979 to the legislative bodies, as required by the new budget cycle and procedures of the Organization. It was further informed that in preparing these work programmes, proposals and medium-term plans, the Division took into account the recommendations of the Second Meeting of Experts on the United Nations Programme in Public Administration, pertinent resolutions on public financial management, directives of the legislative bodies concerning the programme and the resources available for its implementation. The Division was also required to give more concrete information on its activities and outputs. Under the prevailing budget system of the United Nations, the Division will be expected to prepare its biennial work programme and budget for 1978-1979 and medium-term plan for 1978-1981 some time in 1976 and the recommendations of the Meeting will be greatly useful to it in that connexion.

120. In reviewing the medium-term plan, the Meeting found that the proposed objectives were more directly oriented than before towards administration of development plans and programmes. The number of objectives was also kept limited and confined to issues of greater relevance and urgency for national development efforts. The Meeting commended the Secretariat for preparing the proposed medium-term plan and urged its approval by the legislative bodies concerned.

121. At the same time, the Meeting made certain observations on the current work programme and the medium-term plan which, in its opinion, deserved serious consideration. It found that, although public administration and public finance subprogrammes were now joined organizationally, current activities in the two were being carried out separately. The Meeting was informed that this had happened because the two subprogrammes had been assigned to different organizational units before 1974 and the work programmes for each one of them for the current biennium (1974-1975) had been formulated and approved separately in 1972.

122. The medium-term plan makes a start in proposing certain common objectives for the two subprogrammes (for example, country profiles and surveys of changes and developments in public administration and finance, public enterprises) but, in the opinion of the Meeting, this did not go far enough in integrating these aspects of public administration. The reasons for this were understandable but the Organization should substantively integrate as many projects in the forthcoming medium-term plan as possible. In future, every effort should be made to develop multifaceted and comprehensive research and development projects to maximize their effect for development plans, programmes and projects.

123. The medium-term plan also needs to be extended and appropriately modified for the Division to be able to develop policy proposals for consideration by legislative bodies as discussed in paragraph 118 above. This represented a significant departure in the Programme and deserved special consideration by the legislative bodies concerned.

Next review of the Programme of the Division of Public Administration
and Finance

124. For the reasons explained below, the Meeting strongly recommended, after taking into account the financial implications of its recommendations, that the Secretary-General convene the next Meeting of Experts to review the United Nations Programme in Public Administration and Finance in 1977:

(a) The time available to the Secretariat had not been adequate to report fully to the present Meeting on the integrated work programme in public administration and finance. It should be able to do so by 1977 for consideration by the Meeting;

(b) The Meeting in 1977 should be able to consider the special measures proposed by the Secretariat for implementation of decisions taken by the special sessions of the General Assembly on the New International Economic Order;

(c) The Secretariat should obtain more specific information on public administration and finance problems involved in implementation of the International Development Strategy for the Second United Nations Development Decade in the light of its mid-term review, to provide the basis for initiating ideas and actions in this field for the decade of the 1980s.

X. CONCLUDING REMARKS

125. The Meeting of Experts,

Having reviewed the recent changes and trends in public administration and finance in developing countries,

Concluding that public administration and finance systems remain a limiting factor to the achievement of national objectives under the International Development Strategy for the Second United Nations Development Decade,

Recognizing that the implementation of the Programme of Action for the Establishment of the New International Economic Order requires further strengthening of public administration and finance systems in developing countries,

Having in view especially the needs deriving from the ever-growing size and role of the public sector enterprises in the national economy of developing countries,

Recommends to the Committee on Review and Appraisal, the Economic and Social Council and the General Assembly:

(a) That the revision of the International Development Strategy include a request to developing countries to pay special attention to improving their public administration and finance systems along the lines indicated in the report generally, and to measures mentioned in chapter VII of the report specifically;

(b) That the Secretary-General be requested to formulate public administration and finance measures at national and international levels required to implement the Programme of Action for the Establishment of the New International Economic Order, and to consider the feasibility of measures for forecasting specific public administration and finance objectives for the 1980s and of initiating steps for formulating them;

(c) That the proposed work programme of the Division for 1976-1977 and the medium-term plan for 1976-1979, as set out in the Secretary-General's report, be approved in the context of observations of the meeting in the report, particularly the further substantive integration of public administration and finance components of the Programme and any new requirements as visualized in (a) and (b) above;

(d) That United Nations Development Programme be asked to give particularly sympathetic consideration to institution-building projects at national, regional and interregional levels, and to measures for development and dissemination of information on critical problems of public administration and finance in developing countries; and

(e) That the Secretary-General be requested to convene the next Meeting of Experts in 1977, inter alia, to (i) review progress in public administration and finance for implementing the revised objectives of the International Development

/...

Strategy; (ii) recommend additional measures appropriate for implementing the New International Economic Order; (iii) review feasibility for the development of pertinent objectives for the 1980s; and (iv) in the light of the foregoing, to review the United Nations Integrated Programme in Public Administration and Finance.

SCOMM

#9:84

Out Of Foresight . . . Opportunity

With much of the nation shivering and many workers idle, Victor Alhadeff is busy pursuing opportunity.

LATE LAST MONTH Damson Oil & Gas Drilling Program 74-2 sold out its producing wells to Libbey-Owens-Ford for \$4 million. No, Libbey-Owens was not diversifying; it was looking for sources of fuel to avoid future shut-downs like those that paralyzed its plants during the recent cold crunch.

Libbey-Owens was the third company in the last few months to go this route, and many more will be doing so shortly, according to Victor D. Alhadeff, 30, chairman of ENI Corp. in Seattle, Wash., leading oil and gas tax shelter specialists. In less than six years Alhadeff has become the largest single factor in financing independent oil and gas enterprises in the U.S.; many of the Damson investors were his clients. Says Alhadeff: "We are negotiating with three New York Stock Exchange companies to sell them producing wells, as in the Damson deal."

"That potential," says he, "was set in motion in early January at an ener-

gy conference on acquiring natural gas in the field in Houston, Tex., which was attended by 120 blue-chip companies. The consensus reached then by a majority of the companies was that they should invest in new drilling ventures directly as well as buy existing production of natural gas. As a result, you're going to see several hundreds of millions coming from this source this year and next."

All that won't solve the natural gas shortage by a long shot, but it will provide a bonanza for drilling investors and for people like Alhadeff.

Since he began in 1971 he has steered some 1,600 clients into \$130 million worth of oil and gas funds. Moreover, Alhadeff has also brought out his own diversified drilling fund. It will put investors into a group of oil and gas drilling ventures with numerous different operators, thus giving them a play in many areas.

While moving fast to take advantage of the gas shortage, Alhadeff has



Alhadeff Of ENI: He expects blue-chip companies to put "hundreds of millions" into energy ventures.

rather harsh words for the policies that produced the shortage. He says: "It is ironic that the two states hardest hit by gas shortages, Pennsylvania and Ohio, are states that are sitting on top of lots of old partially depleted wells. But the price for intrastate oil in those states was set so low by politicians that no one wanted to drill and wind up losing money. If the politicians had set the price at \$2 per thousand cubic feet as they do in Texas, those states wouldn't be in as desperate a situation as they are in now."

Having delivered himself of this blast, Alhadeff picked up the telephone to talk with a prospective investor. Like smart businessmen everywhere, he is, in the end, less interested in past problems than he is in pursuing present opportunities. ■

"Way Up There . . ."

... The question is: How will 400,000 people in Alaska spend over \$7 billion?

BETWEEN NOW and 1985, the state of Alaska's share of North Slope, Prudhoe Bay and Cook Inlet oil and gas production is expected to exceed \$7 billion. Revenues from the state's substantial coal, iron ore and molybdenum reserves could boost Alaska's income by billions more. The question now facing the state's 400,000-odd residents is: What will we do with all that money?

Late last month, FORBES obtained a copy of draft legislation detailing part of Governor Jay S. (for Stener) Hammond's answer: Nine neatly typed pages outlining the creation of the "Alaska Permanent Fund," a concept approved overwhelmingly by

Alaskan voters last November. While the language is loose, two things are clear: The Permanent Fund will hold the keys to a good deal of Alaska's future development. And, the Fund will be no free-lunch wagon.

In general, the Permanent Fund will be part savings bank, part development bank. Specifically, the draft bill provides that:

- One-half the revenues derived by Alaska from its mineral resources—expected petroleum revenues alone should bring the Fund's balance to nearly \$4 billion by 1985—must be put into the Permanent Fund.

- At least 40% of the Fund's balances must be put into "investment-

grade securities"—presumably corporate and government debt.

- As much as 30% of the remainder may be used for low-interest loans and other incentives to supplement private capital within the state.

- No more than 30% of the Fund may be used for public works.

- If the Permanent Fund is directed to invest in projects earning less than market rates of return, then the state's general fund must make up the difference and pay it into the Fund.

If the Alaska Permanent Fund sounds fiscally conservative, it is—and by no accident. Last August, Alaska's State Investment Advisory Committee, which drafted the legislation, hired Wall Street investment bankers White, Weld & Co. to aid in the Fund's design. Explains Charles J. Fuhrmann II, the dapper, 32-year-old White, Weld first vice president working behind the scenes on the proposed legislation: "We tried not to be

Harvard Business School-ey and tell the Alaskans what to do. But we have told them the risks in terms of their credit standing if the Fund doesn't get the market rate and becomes, instead, a little welfare station subsidizing everything in sight."

But Fuhmann is the first to stress that the Fund's political hassles are only about to begin: "Everyone is trying to keep things friendly and make this bill look like a consensus. But the real wars are still to come. No one has had a chance to present an alternative. But when this bill goes to the legislators, everyone will."

The problem is that Alaskans are as

diverse as the state is rich. It took voters years to decide whether to keep their state capital in Juneau or move it to Anchorage. (Last November's decision: Build a new capital somewhere in between Anchorage and Fairbanks—a "North Brasilia" as some wags already dub it.) So you can imagine the coming struggle over who will control the Permanent Fund, and how its income should be used. Some groups want to reinvest it all. Others want to spend it all—on "North Brasilia" perhaps. Still others want to divvy the Fund's income among the state's citizens. By 1985 each year's dividend could well exceed \$1,000

for each Alaskan resident.

"The amazing thing in all this," says Fuhmann, "is that it's happening just 4,000 miles away, yet no one on Wall Street is aware of it. There's this feeling that, 'Well, it's Way Up There ...' But suddenly the Fund will be there with lots of money in it, and Wall Street will be beating down the Alaskans' doors with lots of investment opportunities and recommendations and so forth. And we hope still to be up there helping the Alaskans evaluate all those proposals."

Moral: However cold it may be, get your foot in the door. It seems White, Weld has already done so. ■

GENERAL

SCOMM

#9:85

STORAGE, TRANSFER, AND USAGE OF
ALASKAN ENVIRONMENTAL INFORMATION

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Historically, resource development in the Arctic has prompted major scientific research and dissemination of information. Each phase of resource exploitation has triggered a new round of efforts to find out what is known about the Arctic and to learn more.

The discovery of oil reserves on the North Slope spurred the most recent environmental research response in Alaska. Past cycles resulted from whaling, fisheries, gold, agriculture, Naval Petroleum Reserve No. 4 (NPR 4)^{1/} reconnaissance, and activities related to national defense systems. Establishment of the Naval Arctic Research Laboratory, growth of organized research in the University of Alaska, and the expansion of state and federal agencies have generally followed in response to these cycles.

Funding and production of scientific information in recent years has depended on national priorities. Almost 25 years ago the Conservation Foundation conducted an Alaskan resource study for the Department of the Interior. The report recommended that more information should be compiled on the location and extent of resources, opportunities and risks of development, and methods of arctic resources management. Nearly every Alaskan

^{1/}Pursuant to P.L. 94-258, renamed as of June 1, 1977, the National Petroleum Reserve in Alaska

Science Conference during this period recommended that an Alaskan-based center of arctic knowledge should be established. In 1967 the Federal Field Committee for Development Planning in Alaska and the President's Review Committee for Alaska (at this time mostly members of the Cabinet) endorsed this concept.

The Alaska legislature established the Arctic Environmental Information and Data Center in 1971 in response to this need. Since then, demands for reliable scientific information on Alaska's resources and environment have increased rapidly due to trans-Alaska oil pipeline construction, inventory and transfer of ownership of land and resources involved in the Alaska Native Claims Settlement Act, oil and gas leasing activity by the state and federal government on land and the outer continental shelf, and increased exploration activities in NPR 4.

Despite the recurrent myth that knowledge is lacking, a great deal is known about Alaska; however, many sources are unpublished and obscure. Collection of these often valuable data is impractical for most individual users. Although Alaska does not have a large technical library, a number of smaller specialized libraries and resource centers cooperate to avoid duplicate collections through information exchange and promotion of awareness of current projects and reports. Figure 1 shows locations of major information centers in Alaska.

INFORMATION CENTERS IN ALASKA

Major collections are at the following locations:

University of Alaska, Fairbanks--The Elmer E. Rasmuson Library houses the largest collection in the state with more than half a million books and

government documents. The Fairbanks campus publishes quarterly a computer printout of the serials of the Fairbanks campus libraries. The University is also developing a union list of serials that will list the holdings of the major libraries in the state of Alaska. Presently, a pilot project is underway involving a few of the major libraries, such as the State Library in Juneau, Loussac Library in Anchorage, and the Anchorage and Fairbanks University campus libraries. Publication is scheduled for the first of the year. The University publishes the Bibliography of Alaskana, which each month indexes periodical articles on Alaska by key word and is cumulated annually.

University of Alaska, Anchorage, Library--This library has the second largest research collection with approximately 290,000 books and government documents. Emphasis was placed on the social sciences until 1975 when the scope of the collection was broadened to include more natural science publications.

Alaska State Library, Juneau--The State Library has approximately 90,000 books and government documents, many of historical significance. Much of its service is through interlibrary loans. The Alaska Division of State Libraries and Museums publishes the Alaska Library Network Resource Directory, Alaskana Project. The 1975 publication has author, title and subject indexes to the Skinner Collection of the Elmer E. Rasmuson Library. This Division also compiled A Guide to Alaska's Newspapers in 1976.

Unique subject collections and information services are available at the following locations:

Naval Arctic Research Laboratory Library, Barrow--The "Barrow File" comprises 10 five-drawer file cabinets containing reprints of articles

written by researchers using the Laboratory's facilities and copies of interim and final reports on research supported by the Laboratory. Findings and results in some reports have never been published and are not available anywhere else.

Geophysical Institute, University of Alaska, Fairbanks--This library contains ERTS/LANDSAT imagery, U2 photos of Alaska, an archives of worldwide auroral investigations (including magnetic and color video tapes), and ice fog and climatic data.

Institute of Marine Science, University of Alaska, Fairbanks--The IMS library produces a computerized keyword in context index to its reprint file, which includes several thousand articles on marine sciences. Unpublished and uncompiled oceanographic data on Alaskan waters are in the Institute's files.

Alaska Cooperative Wildlife Unit, University of Alaska, Fairbanks--This library maintains a file of worldwide wildlife research papers with emphasis on Alaskan caribou, reindeer, bear, ptarmigan, and marine mammals.

Alaska Health Sciences Information Center, Anchorage--This center has a science subject collection which concentrates on cold weather human physiology, medicine, and arctic environmental health problems. Computer searches through the national MEDLINE system are available. This center stresses service to the Alaskan medical profession and provides telephone and mail service.

Alaska Resources Library, Anchorage--The Department of the Interior regional library emphasizes published environmental information about Alaska. This library receives copies of reports indexed in the Cold Regions Research and Engineering Laboratory's Current Literature: Cold Regions Science and Technology. (The Corps of Engineers District Library receives reports listed in the USA CRREL Technical Publications.)

Arctic Environmental Information and Data Center, University of Alaska, Anchorage--This center is a repository of unpublished reports and information and is staffed with subject analysts who are available for in-depth consultation. A referral file of people with expertise in specific subject areas provides additional depth. AEIDC indexes publications by author, title, subject and geographic area and can manually create bibliographies on demand. AEIDC maintains the only comprehensive file of Alaska weather records in the state and also serves as a source of ERTS/LANDSAT imagery for the Anchorage area. The center publishes current information on Alaskan resources and natural systems with appropriate maps and graphics and annually produces the Current Research Profile for Alaska, which documents natural resource investigations and environmental research underway in Alaska. AEIDC also operates a microfiche duplicating service for many hard-to-get Alaskan publications. Although heavily used by government agencies and consulting firms these services are also available to the general public.

Sheldon Jackson College Library, Sitka--This library contains the Andrews Collection of historical documents and photographs.

Auke Bay Fisheries Laboratory Library, National Marine Fisheries Service, Auke Bay--This laboratory has an in-depth collection of oceanographic and fisheries biology information, including published reports.

U.S. Bureau of Mines, Alaska Field Operations Center, Juneau--This center maintains a collection on Alaskan mining and mineral resources. Publications and maps are available.

U.S. Geological Survey, Public Inquiries Office, Anchorage--This office sells USGS publications and maps and maintains an extensive collection of their past publications.

Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys--This agency has a Kardex file of Alaskan mining claims. This information appears on computer listings and data sheets and provides records of all patented and unpatented mineral claims since 1953 by quadrangle, owner, and mineral. The Kardex file is available at the four Mining Information Offices in Anchorage, Fairbanks, Juneau and Ketchikan.

OTHER INFORMATION CENTERS

Other Information Centers pertinent to Alaska are:

Arctic Institute of North America, Calgary, Alberta, Canada--Founded in 1945, AINA has its headquarters and its library at the University of Calgary. The primary objective of AINA is to study arctic and cold weather conditions. The library has arctic materials in many languages, subjects, and formats. They publish the Northern Research Survey listing ongoing research and Arctic, a quarterly journal.

Boreal Institute of Northern Studies, University of Alberta, Edmonton, Alberta, Canada--This institute concentrates on the northern circumpolar area, especially Canada's North. The library has information on scientific developments (particularly conference proceedings), theses, and technical reports. The library maintains the Carl Lomen collection on Alaska. Since July 1972 the library has published Northern Titles, an index of selected English titles of northern, antarctic, and alpine articles from journals received at the institute.

U.S. Army Cold Regions Research and Engineering Laboratory Library, Hanover, New Hampshire--The library collection supports research on physics

and mechanics of cold region materials and engineering. Most of the collection is in English, but pertinent Russian information is also available. CRREL publishes technical reports, and the Library of Congress prepares the monthly announcement bulletin, Bibliography on Cold Regions Science and Technology.

Ohio State University, Institute of Polar Studies, Columbus, Ohio--The institute has a collection of approximately 7,000 items, mainly on physical and biological sciences.

Dartmouth College Library, Stefansson Collection, Hanover, New Hampshire--The Stefansson Collection has documents on the history of arctic regions through 1925 and antarctic regions through 1940 as well as other specialized areas. The library publishes the annual Polar Notes, which contains articles of general and scientific interest on polar topics.

Center for Northern Studies, Wolcott, Vermont--The center has a small northern regions collection and emphasizes the flora of Alaska and the Bering Land Bridge (Beringia). An adjacent herbarium has many plant specimens from Alaska.

University of Colorado, Institute of Arctic and Alpine Research Library, Boulder, Colorado--This environmental information library covers all alpine and arctic areas but concentrates on northern Canada and alpine Colorado. The institute publishes the quarterly journal, Arctic and Alpine Research.

Battelle Memorial Institute, Columbus, Ohio--Battelle archives a complete file of bioenvironmental information relevant to nuclear testing and its effects at Amchitka Island and the western Aleutian Islands.

U.S. Geological Survey, Technical Data Unit, Alaskan Geology Branch, Menlo Park, California--All field and research files by this unit are kept,

and copies are sent to several depositories in Alaska. A 10-year project, the Alaskan Mineral Resource Assessment Program, began in 1974 to appraise Alaska's mineral resources through mapping and aeromagnetic and geochemical analyses.

University of Washington, Fisheries Research Institute, Seattle--This institute's data files on Alaskan salmon fisheries are among the most complete. In the late 1940s and early 1950s salmon fisheries in the Prince William Sound area and southeast Alaska were emphasized, but by the mid-1950s Bristol Bay and the Kodiak-Chignik areas gained importance. This institute is the best source of information for a history of Alaskan salmon fisheries.

U.S. Forest Service, College of Forest Resources, University of Washington, Seattle--The Forest Service has an information system called the Pacific Coast Forest Research Information Network. The principal points of service are at the Forest Service Offices in Berkeley, California, and at the University of Washington. This system provides information services to forestry researchers in Alaska, Washington, Oregon, California, and Hawaii. It provides interlibrary loan services, literature searches (manual and computer), reference services, and publication of Monthly Alert (a selected listing of new acquisitions from the libraries of the information network).

National Computerized Information Systems--Some Alaskan and arctic information is stored in the computerized data bases of such information systems as NOAA's, Oceanographic and Atmospheric Scientific Information System (OASIS) and Environmental Data Index (ENDEX), EPA's, Storage and Retrieval of Data for Water Quality Control (STORET), Interior's, Water Resources Scientific Information Center (WRSIC) and Commerce's, National

Technical Information Service (NTIS). However, the quantity of arctic data included is small compared to the amount available, and there is a long delay before information is incorporated in these systems. Private computerized indexes, such as the Systems Development Corporation and the Lockheed systems contain some data bases included in OASIS but have similar limitations for retrieving Alaskan information. The Smithsonian Science Information Exchange (SSIE) indexes research funded by both federal and nonfederal sources in Alaska, but their data base is limited by their suppliers of information.

PROBLEMS IN ALASKA DATA TRANSFER

Seldom has an adequate background understanding of an Alaskan area or resource been obtained prior to development. Although not a unique situation, it has been accentuated in the Alaskan experience. Early residents of the Territory were almost all concerned with resource exploitation and there is but sketchy reference to their works. Additionally, early scientists, developers, and later, managers were most often headquartered outside Alaska, and their data usually remained outside as well. Comprehensive information was seldom available for those who remained in the North. The results of early Alaskan environmental and resource work have been scattered across the United States and, indeed, the world. Much of it is lost to today's researcher, and if it is discovered, its meaning and value are rarely recognized.

Prior to this century, scientific research was usually part of an expedition such as the 1850s investigation by Western Union of the possibility of running a telegraph cable through Canada, Alaska, Siberia and eastern Europe

to connect the United States and Europe. The effort ended abruptly when a successful trans-Atlantic link was announced, and the excellent scientific observations begun along the proposed northern route were inadequately recorded and never completed. Scientific interest in Alaska seemed to run in cycles, often determined by some totally unrelated scheme or goal. As a result, the historic record of scientific investigations in Alaska is patchy in geographic coverage, discipline, validity, accessibility, and current acceptability.

Today, amid the rush for resource information, the "expedition mentality" is still found as librarians and research technicians delve separately into the literature and the environment of the latest popular subject. Funding fluctuates, and duplication is inevitable. Each succeeding "platoon" of information seekers turns up the same readily accessible literature as the previous group and justifies it as appropriate because it was used before. The same data and published literature are recycled many times to produce "current" reports, environmental impact statements, and studies. Another problem is that job mobility and harsh climate produce a high turnover of people who take their expertise with them when they leave the state.

No completely adequate system for rapid and comprehensive data transfer exists in Alaska. This hampers district offices of state and federal agencies in their resource management tasks, industrial efforts, academic pursuits, and the public's right to know situation facts. Since the limited information resources are concentrated in Juneau, Fairbanks, and Anchorage, researchers, as well as the general public, in outlying areas are handicapped by inadequate access. Even the information flow between these three

centers is slow. In early 1976 a computer system became available statewide to the university community, but few of the information resource centers are accessible through this system.

Information transfer between Alaska and other states is even worse. No computerized information system dealing primarily with environmental or resource information links an Alaskan entity to the lower 48, and the information in these national networks is largely unknown and inaccessible to all but a few. A reason for this situation lies in the fact that there is no time-share network for Alaska. Available telephone circuits are expensive and risky for data transfer.

Transient or new researchers in Alaska face phenomenal problems. Information sources and systems are not well known as to location, subject specialty, or documented services. Most people find out about the existence of these sources by "word of mouth." Currently, maximum efficient use cannot be made of available Alaskan data.

Other than the document depository system at the Alaska State Library in Juneau, no systematic update system exists for continuous information resource currency. Researchers are not required to file data or publications with any information system except research projects of certain federally funded programs, such as those of the National Oceanographic and Atmospheric Administration's Outer Continental Shelf Assessment Program which requires that this information be sent to the National Oceanographic Data Center. Recent and in-progress research are difficult to keep track of on certain subjects. Several services attempt to document ongoing research in Alaska: Northern Research Survey (Arctic Institute of North America), Smithsonian

Scientific Information Exchange, and the Current Research Profile for Alaska (Arctic Environmental Information and Data Center), which is the most complete.

ALASKA DATA TRANSFER--PRESENT AND FUTURE

Existing information centers in Alaska should be linked by computer system to form a master information network with information transfer, storage, and access. Each resource center would maintain its unique collections but have computer terminal access to a master listing of the others. This list could be indexed by author, title, and key words. All identified Alaskan material which is unavailable in the state should be listed and an "outside" source identified, if known. Published and unpublished Alaskan material unavailable within the state should be actively sought for inclusion in the network. Eventually, terminal access should be established into this system from every library, secondary school, and higher education unit in Alaska. Expansion of satellite stations throughout Alaska makes public communication and computer access from rural areas a realistic goal for the future.

Cooperation already exists between most of these centers through the Alaska Library Association. Several attempts at compiling a listing of statewide holdings have been made, and the statewide University of Alaska computer system makes an information network of communication terminals a possibility.

The four necessary ongoing activities to maintain such a system are:

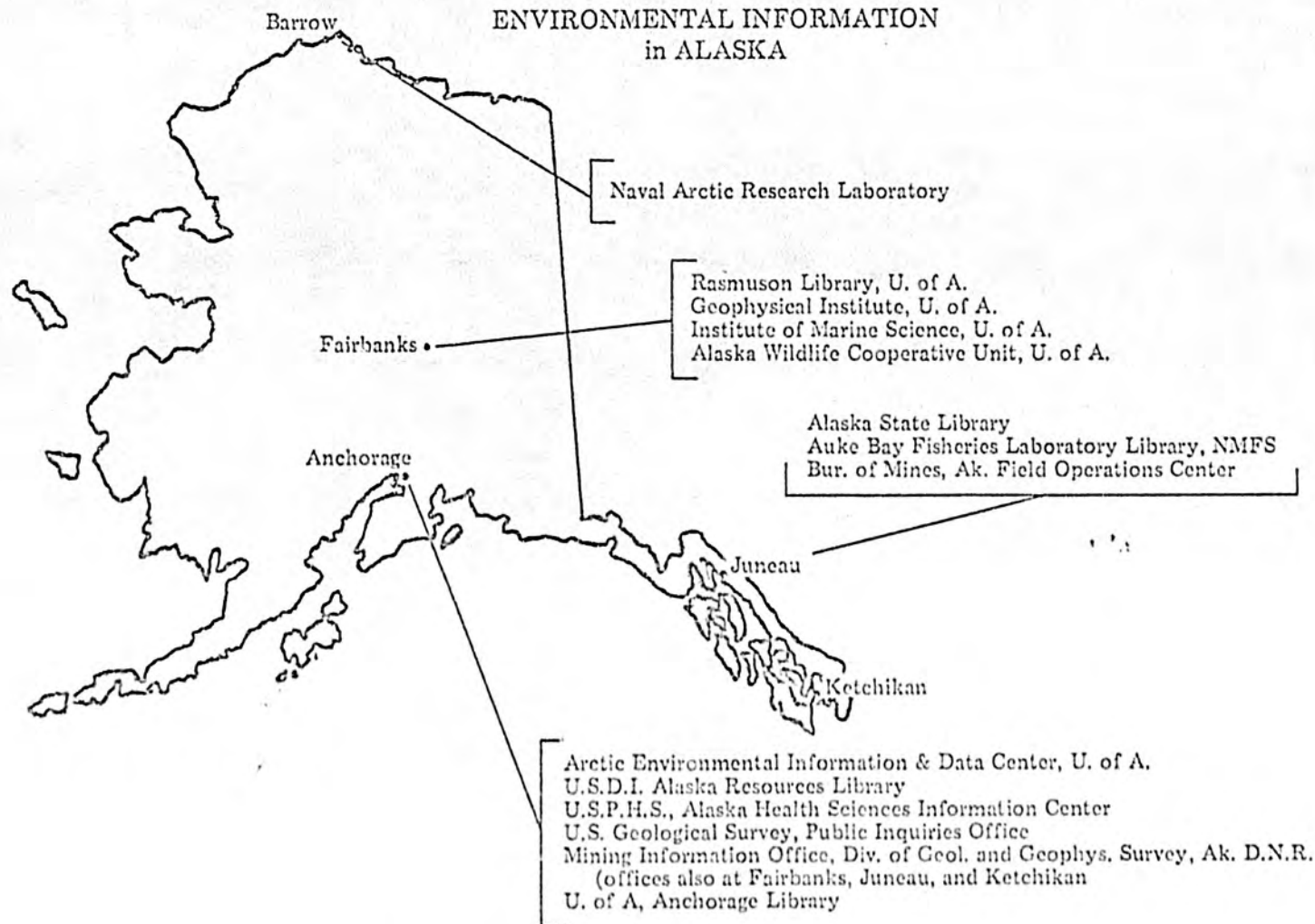
1. Mandatory archiving of all reports, studies, theses, manuscripts, publications, and other documents pertaining to Alaska by the most appropriate center in the network with submission of materials by all local, State, and Federal agencies;
2. Registration of all new research begun in or about Alaska with one designated unit in the master network;
3. Maintenance of files, identifying key individuals (inside and outside Alaska) who have expertise in a given field; and
4. Acceptance by all parties of a single coordinating organization.

Computer access must be established between the network (through one or more centers) and comprehensive or complementary national computerized information systems. This would provide access for Alaskans to broader policy, theory, and management documentation which is lacking now, and it would open a wealth of Alaskan information to individuals outside Alaska.

A monthly newsletter could acquaint potential users with the services available, new acquisitions, and general information transfer news and would automatically be mailed to registered researchers, key experts, libraries and schools in Alaska, and all local, state and federal agencies.

In summary, Alaska is the subject of extremely rapid resource and environmental decisions. The knowledge for most of these decisions either exists or is being rapidly acquired. The research, management, and information dissemination community concerned is relatively small. It is manageable. We need only to organize, fund, and operate a cooperative and efficient system.

MAJOR SOURCES
of
ENVIRONMENTAL INFORMATION
in ALASKA



ALASKA RESOURCE INFORMATION SYSTEM

(ARIS)

PREFACE

A modern state, like a modern business, must have information on all its assets, liabilities, products, and markets to be able to arrive at sound decisions that will benefit all of its "owners." The knowledge of "land and water," the State's prime assets, has become increasingly important as the state and federal governments plan to maximize the best use of these assets and try to avoid the mistakes made in other parts of the world where uncontrolled developments, unwise loss of prime agricultural lands, destruction of important wetlands, loss of fish and wildlife habitat have created irreversible disruption of land and water cycles.

State and federal agencies need a variety of information and a common data base to effectively administer various programs directed to land conservation and development. Data needs range from water resource inventory, flood control, and waste-water treatment to the need for comprehensive land use inventories of existing and changing activities on public and private lands to improve management. Federal and state agencies also need data to assess the environmental impact of the development of energy resources, to manage wildlife resources and minimize man-wildlife ecosystem conflicts, to make national summaries of

land use patterns and changes for national policy decisions, and to prepare environmental impact statements and assess future impacts on environmental quality.

Unique to most of the nation, the State of Alaska has already developed documents designed to distribute data to policy makers, scientists, and the public. The six volumes of The Alaska Regional Profiles establish the first systematic filing of maps, statistical data, and text that can be updated and refined. The Profiles were based on information on the physical and biological environments compiled by the Resources Planning Team of the Joint State-Federal Land Use Planning Commission in the first phase of its operations. These data were refined, correlated, updated, and published by the staff of the University of Alaska's Arctic Environmental Information and Data Center, which was established by the Alaska legislature in 1971 to assist in the retrieval and distribution of data related to land and water use.

The Profiles have already been used extensively by Federal and State agencies, and members of Congress as they gather the facts needed to determine policy for management, tenure, and use of Alaska's land and resources. Even greater use can be expected when Congress reconvenes with new members to consider these issues. The importance of providing these data to those who will make these determinations cannot be over-emphasized. The detailed maps in the Profiles graphically illustrate the complexities and variety in the natural and man-made systems in Alaska, and they provide a concrete, factual framework on which to base a permanent retrieval data system.

One of the major justifications for funding of the Profile series was that they would develop a permanent method of data retrieval and updating and would provide the experience to make recommendations directed to establishing the most effective system to accomplish this task. We believe that the state and federal governments will receive the greatest benefit from their investment in the Profiles by developing an automated filing system which can input new data, update existing data, manipulate the data, retrieve the data quickly, and provide new information in a variety of formats for the maximum amount of users and topics. Such an interagency data collection system of retrieval, storage, and publication could become a model for the rest of the country.

Justification

The need for coordinated land use planning by informed decision makers has become imperative. Land use planning, natural resource management, and environmental control are among the most important national issues. The pressures of expanding population, urban growth, shrinking energy supplies, and environmental deterioration have brought the public to the realization that we must carefully plan for the wise use and optimum development of our land and natural resources. The establishment of new agencies to deal with environmental protection and energy crisis along with the introduction of legislation directed to minimize adverse environmental impacts reflects these concerns at a national level. State and local governments have enacted legislation dealing with development controls and systematic land use planning. Industry has responded by developing new techniques and tools to comply with new regulations and solve some of the problems created by past neglect or expediency.

To develop a natural resource policy or strategy for the balanced conservation and development of natural resources decision makers must have ready access to current and meaningful natural resources data. Most of the necessary data exist but they are often widely scattered among many agencies which have never standardized the type of data collected, the scale of maps used, the format of data presented, geographical reporting region, and frequency of updating. Consequently, data generated by one agency is frequently unknown or unusable by another, which, results in confusion, unnecessary duplication of effort, and unnecessary cost for the taxpayer.

A single integrated information system that is flexible enough to permit manipulation and display of a wide variety of data in many formats for various users would eliminate much of this waste.

Benefits

The immense amounts of data required to develop and manage land use plans can no longer be simply and manually controlled. For many federal and state organizations, the problems of data distribution have reached unmanageable proportions. For example, the Federal-State Land Use Planning Commission, with responsibilities for identification of and recommendations concerning the uses of lands in federal ownership, faces a tremendous challenge. To conserve where necessary, to develop where practical, and to offer knowledgeable leadership and cooperation with private and public interests require knowledge and responsible judgement.

The proposed Alaska Resource Information System (ARIS), is designed to aid various Federal and State agencies and private interest decision makers in land use planning and management.

The initial step in developing a management oriented system requires an in-depth understanding of specific problems confronting the Federal-State Land Use Planning Commission management. A preliminary outline of goals, policies, development direction, limitations, and potentials has been developed to channel this effort toward the most productive results. This outline will undoubtedly undergo modifications and refinements as Phase I work uncovers new factors to be considered. Nevertheless, a working framework has been designed to govern and direct the ongoing program of developing the appropriate and necessary tools for the Federal-

State Land Use Planning Commission to better manage its responsibilities. The Commission supported the preparation of the Profile series as a summary of the data base needed for planning.

The next step to make this unique resource information repository current and accessible to the maximum amount of users is to develop an automated filing system. The correlation of maps in the Profiles will provide a framework for evaluating the interrelationships between various resources and the effect of climate, soils, topography, and other factors that affect development in Alaska. A computer system could provide accurate, detailed information rapidly, and data could be easily updated.

Objectives

Alaska is a logical testing ground for the development of an interagency (state-federal) computer-based information system designed to aid resource development and land use planning. Land use, development, and management decisions are of such large magnitude that they demand the most innovative methods and approaches.

This project has the following goals:

1. To provide a computer retrievable file of all natural resources data (including mineral occurrences of potential economic significance).
2. To make available data to all users on Alaska resources that are now largely inaccessible.
3. To prevent the duplication of cost in data gathering retrieval and distribution that is presently causing a sizeable drain on the various agency budgets.
4. To identify needs for additional data and refinement of available data.
5. To obtain needed information on the technology, costs, and manpower requirements for the development of a permanent computer-based natural resource information system.
6. To test user acceptance of the new approaches to continuing information as well as to seek answers to questions concerning security and availability to computer-stored data.

Implementation Plan

The approach is presented as a three phase structure developed under the coordination of the Federal State Land Use Planning Commission for the first two years, and directed by the user's and technical committee, (See Figure 1.). The value of such a development philosophy is that the basic organizational structure of the system can be established along with a basic level of service which documents the utility of the overall approach and thereby encourages voluntary cooperation. The major elements of the proposed phases are as follows:

o Phase I - First year

- Research coordination
- Reference and referral service
- Publication of sources
- Computerized mapping demonstration with remote sensing
- Users' and Technical committee
- Monitor use of service

o Phase II - Second year

- All of Phase I
- Formal procedures for cooperation
- Compatible data definitions, classifications, etc.
- Computerized resource information system
- Map updating process
- Monitor use of services

o Phase III - each year thereafter

- All of Phase II
- Operation and maintenance of the resource information system center
- Monitor resource information
- Record management activities

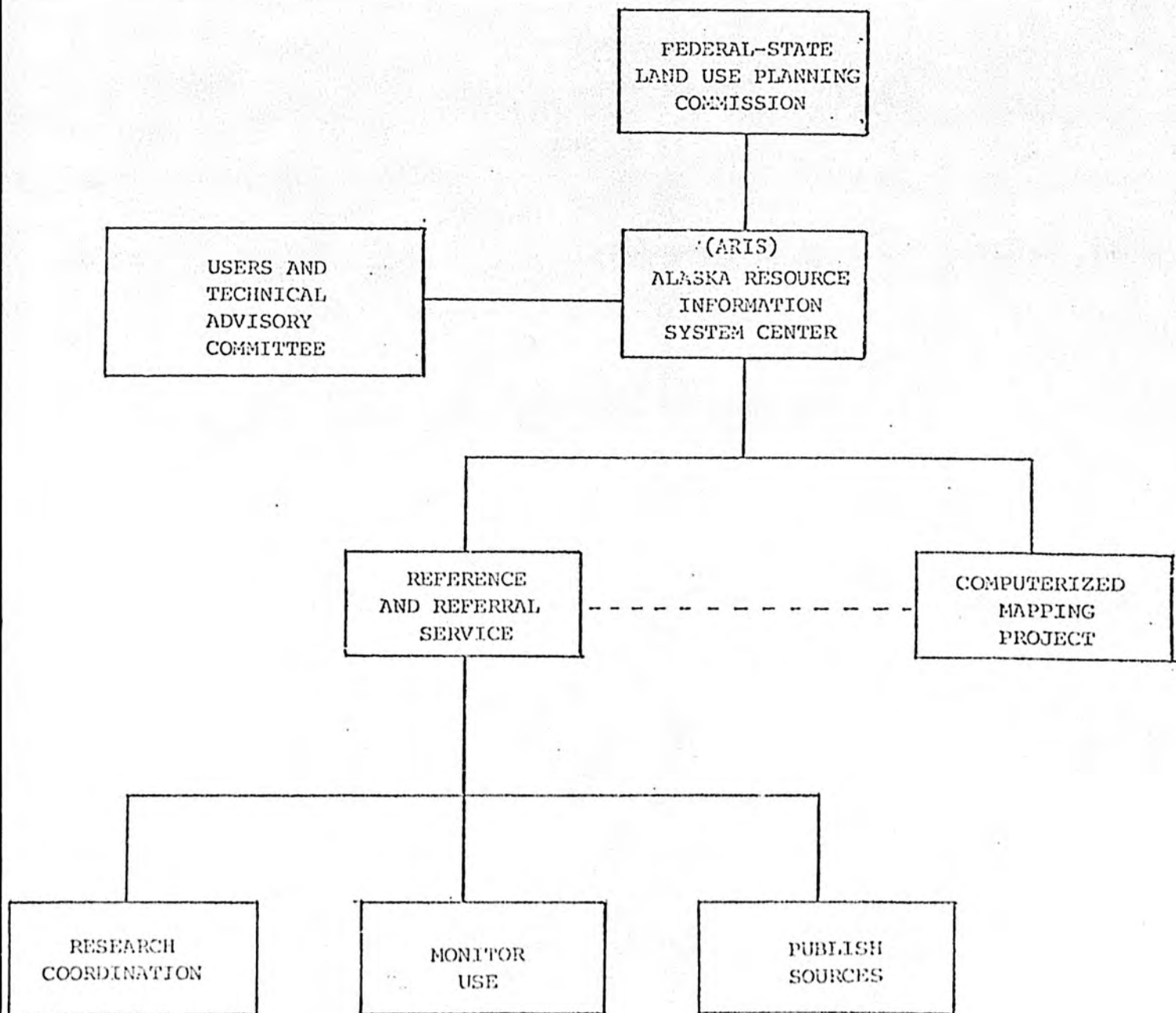


Figure 1. PHASE I AND PHASE II Operational Structure

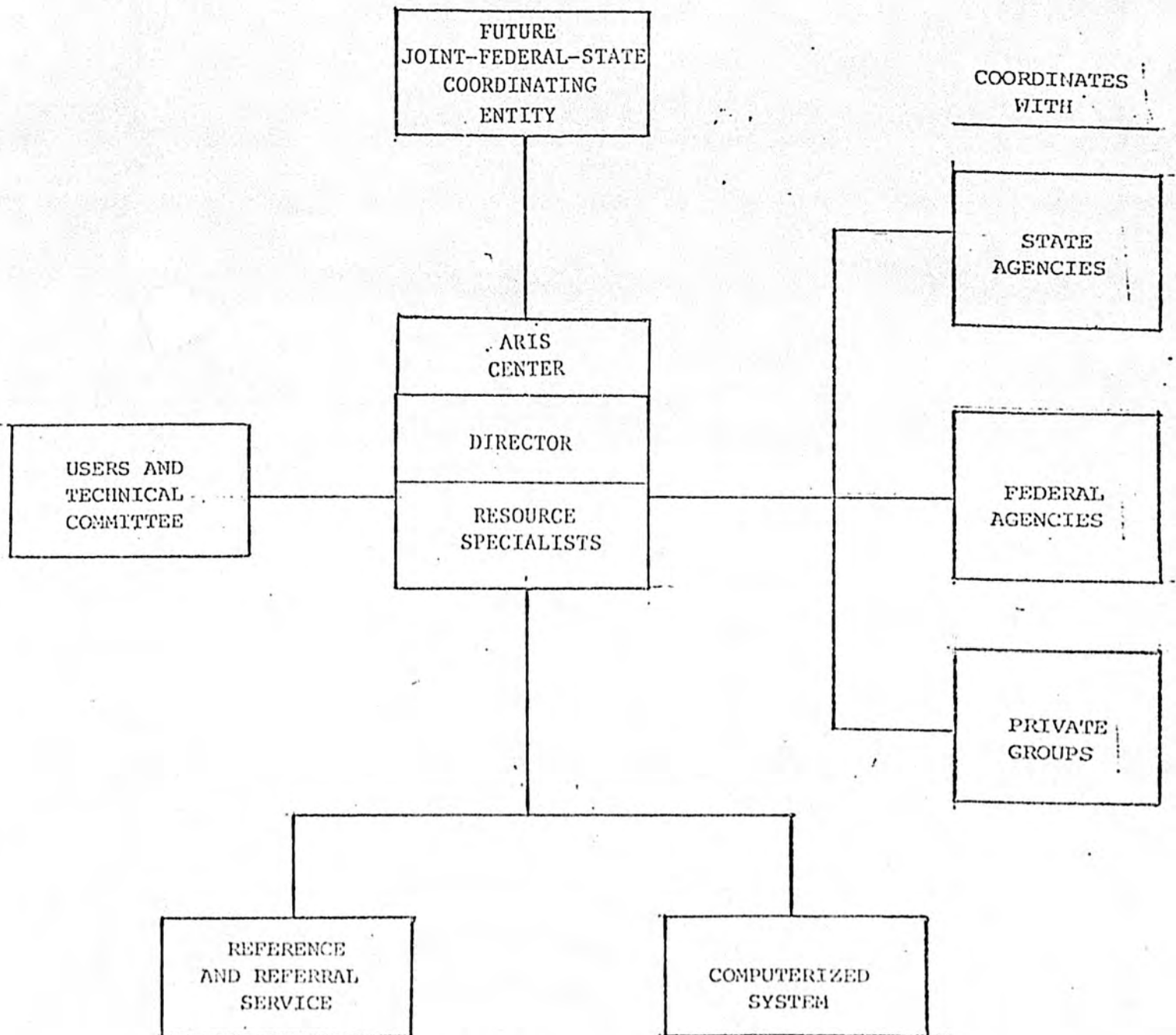


Figure 4. PHASE III - Operational Structure of the
Alaska Resource Information System Center

Conclusions

- o The statewide resource information system would be assigned to the Federal-State Land Use Planning Commission for the development of phases. Phase III would be assigned to a newly created joint Federal-State entity (see Fig. 4).
- o The system would be operated by a separate and distinct organization within the commission initially.
- o The system must be a mandated function in order to serve high priority support of associated agencies.
- o The system would be developed in stages to test the approach and to encourage voluntary cooperation
- o The demonstration project for the mapping system would be conducted before a commitment is made to a complete statewide resource information system
- o A major effort to utilize existing data and to coordinate research must be developed in a reference and referral service
- o Definitive land management policies, objectives, and programs would guide the development of the statewide system.

Cost of developing an Alaska Resource Information Center: (see Appendix A for detailed implementation plans)

Phase I - First year budget

o Reference and referral service	\$ 250,000
o Computerized mapping demonstration	<u>150,000</u>
Total:	\$ 400,000

Phase II - 2nd Year Budget

o Continuation of Phase I activities	\$ 300,000
o Design and develop a statewide resource information system	<u>700,000</u>
Total:	\$1,000,000

Phase III - Each year thereafter

o Operation and maintenance of the computerized resource information system center for the State of Alaska including the updating of the data base and dissemination of information.	
Total:	\$1,500,000

PLEASE NOTE: THE FOLLOWING PAGES WERE TREATED
AS A UNIT IN THE ORIGINAL DOCUMENT.



UNIVERSITY OF ALASKA

February 25, 1977

Rep. Terry Gardiner
Alaska State House of Representatives
State of Alaska
Pouch V
Juneau, AK 99811

Dear Terry:

Following up on our brief conversation on the resource and science information situation in Alaska, I am enclosing the materials which I gave Hugh Malone and John Rader.

My letter is self-explanatory and requests oversight hearings on AEIDC policy matters. If this is done, light will also be shed on what State and Federal agencies are and are not doing in providing information for public decision processes.

The enclosures are background pieces on the information situation here in Alaska.

I plan to return to Juneau, March 1, 2 and 3 and hope we may be able to schedule a discussion on the matter at that time.

Sincerely,

David M. Hickok
Director

Enclosures



UNIVERSITY OF ALASKA

February 21, 1977

Hon. Hugh Malone
Speaker
State House of Representatives
State of Alaska
Pouch V
Juneau, AK 99811

Dear Hugh:

This letter is to suggest to you the scheduling of an oversight hearing by the Resource Committees of the Senate and House on the current operations and future directions of the Arctic Environmental Information and Data Center (AEIDC).

I make this suggestion since it was the resources Committees of the legislature with the support of then House Speaker Gene Guess and Senate President Jay Hammond who created AEIDC in 1972, as a central focus for Alaskan environmental and natural resource information analysis, synthesis and dissemination. During the five years of our existence we have achieved the distinction of being the only viable information center of its kind in the Nation. In fact, several proposals exist to emulate our operation elsewhere in the country to act as other centers of information analysis, synthesis and dissemination on coastal zone, outer continental shelf, natural resource and land use planning matters. Our operations, however, despite several apparent successes and national recognition, are beset by a number of policy problems for which I feel the need of legislative guidance.

Listed below for initial consideration and discussion are ten basic policy questions which trouble the administration of AEIDC. Each policy question is followed by a brief summary background statement.

UNIVERSITY OF ALASKA

Hon. Hugh Malone

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February 21, 1977

1. What is the clientele to be served by AEIDC?

BACKGROUND

In 1976, AEIDC responded to approximately 12,500 requests for environmental and natural resource information and program advice. Of these, about one-third came from state agencies, one-third from federal agencies and the remaining one-third from a large variety of consultant firms, Alaskan industries, public interest groups, Native corporations, educators and the general public. The Center also engages in contract services; in 1976, 67% of the contractual effort was in support of state requests, 21% for federal agencies, 12% for private organizations (primarily oil industry and Native groups).

2. Should AEIDC render free services and/or enter into contractual arrangements with all users of its services equally?

BACKGROUND

In 1976, AEIDC's response to inquiries and requests for advisory services required the dedication of 12,564 man hours, or a little over six man years, of non-reimbursed effort. Additionally, the Center performed twenty-nine contractual tasks for state and federal agencies, Native corporations and private industry. All inquiries or contractual requests are treated equally regardless of source. For much of the information sought, AEIDC is the only source available. Because of budgetary and staff limitations, we need to know the sense of the legislature regarding priorities of both free and contractual services.

3. Should AEIDC establish a formal user charge program beyond present levels?

BACKGROUND

Presently AEIDC only charges inquirers for duplication of materials such as maps, reports, microfiche, etc., on an actual cost basis. Staff time for such duplication is not charged.

4. What should be the proper relationship between AEIDC and governmental agencies? Should AEIDC administratively or the legislature by law, establish long-range terms of reference between AEIDC and local, state or federal agencies for AEIDC's information services?

BACKGROUND

All AEIDC governmental relationships are either through the furnishing of free services responding to requests for information or program advice or pursuant to relatively short-range contracts for specific tasks. A question for consideration is whether government agencies and/or AEIDC could be more efficiently served by long-term agreements under legislatively established guidelines.

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5. Should a special informational service relationship between AEIDC and the Joint Federal-State Land Use Planning Commission be established?

BACKGROUND

AEIDC has had a particularly special relationship with the F-SLUPC in the furnishing of information for the Commission decision processes. However, this relationship has been generally informal except for contractual tasks. Resource and land use planning depends upon a dynamic process of factual application. As a future role for the Commission or its successor evolves, should AEIDC be formally identified as a central information service for the Commission.

6. What should the long-range continuing administrative relationship of AEIDC be with the University of Alaska?

Alternatives:

- a. An administrative function of the U of A Anchorage or Fairbanks;
- b. An administrative function of the President's office;
- c. Administration through a State-University foundation.

BACKGROUND

AEIDC operates its informational service and scientific program on a statewide basis. When first established, the Director of AEIDC reported to the Vice President for Research in the Office of the President. University reorganization in 1976 resulted in organizational cognizance of AEIDC being vested with the Fairbanks campus Chancellor until such time as research management competence was developed in Anchorage. Neither arrangement (i.e. reporting to regional campus Chancellors in Anchorage or Fairbanks) seems adequate for the administration and direction of statewide programs.

7. Should the environmental science and natural resource functions of AEIDC be expanded to include socio-economics and public land, resource and environmental law under a new aegis as an "applied" science center or institute?

BACKGROUND

Analysis or synthesis of natural resource, land use and environmental issues is never complete unless knowledge of biology and physical sciences and resources is correlated with the social and economic value systems of man and the framework of laws established by man. AEIDC has sometimes utilized the services of the Institute of Social and Economic Research and other economic and legal sources of expertise in preparing particular reports. In future terms of reference, however, consideration of a formal structure combining natural science and resource specialists with individuals well versed in the social, economic and legal fields deserves some thought.

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8. Is it desirable to centralize all sources of various types of information in the State of Alaska or should there be coordination between several types and kinds of informational centers? In either case, what should be the role of AEIDC?

BACKGROUND

A discussion paper on this subject prepared for the National Academy of Science is appended. Additionally, the F-SIUPC is currently proposing the establishment of an interagency Alaska Resource Information System (ARIS). A paper explaining their approach is also appended.

9. Within what levels and forms of funding should AEIDC operate?

BACKGROUND

AEIDC is currently budgeted a State appropriation within the Organized Research budget unit of the University of Alaska. This appropriation takes care of only about one-half of the cost of AEIDC's public service expenditures. The cost of this public service is, therefore, borne only partly by appropriation. The remainder comes from overhead revenues from contractual services and small grants from the federal or state governments. An analysis of the services performed by AEIDC in relation to funding sources and levels is badly needed.

10. How should the "educational" functions of AEIDC be defined?

BACKGROUND

"Educational" functions currently involving AEIDC personnel include:
teaching of academic courses on a reimbursable basis with the University of Alaska Anchorage;

conducting workshops and seminars on natural resource or environmental issues or problems; and

publication and dissemination of books on Alaskan resources and environments.

Should AEIDC personnel be involved in teaching as well as information analysis and synthesis? Should "educational" activities be expanded to include the development of innovative techniques of information dissemination?

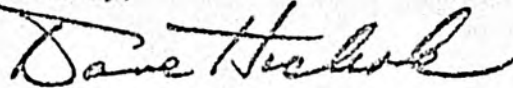
In conclusion may I simply say that I need your help. The entire staff of AEIDC is dedicated to the future of Alaska. We live in a rapidly changing world and our organization needs a dynamic and vital role in delivering readily comprehensible environmental knowledge and understanding to the land and resource use issues of our state.

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Along this line I have had conversations at the national level with our delegation, legislative committee staff members and heads of several federal agencies in late January. I am not sure at this point whether federal interest hearings pertinent to AEIDC will be held by the Congress but in any event I would welcome a public dialogue on our role in this regard, here in Alaska, and urge you to give this suggestion serious consideration.

Sincerely,



David M. Hickok
Director

Attachments

Identical letters sent to:

Hon. John Rader
Hon. Kay Poland
Hon. Al Osterback

STORAGE, TRANSFER, AND USAGE OF
ALASKAN ENVIRONMENTAL INFORMATION

David M. Hickok
Director
Arctic Environmental Information and Data Center
University of Alaska
707 A Street.
Anchorage, Alaska 99501

Historically, resource development in the Arctic has prompted major scientific research and dissemination of information. Each phase of resource exploitation has triggered a new round of efforts to find out what is known about the Arctic and to learn more.

The discovery of oil reserves on the North Slope spurred the most recent environmental research response in Alaska. Past cycles resulted from whaling, fisheries, gold, agriculture, Naval Petroleum Reserve No. 4 (NPR 4)^{1/} reconnaissance, and activities related to national defense systems. Establishment of the Naval Arctic Research Laboratory, growth of organized research in the University of Alaska, and the expansion of state and federal agencies have generally followed in response to these cycles.

Funding and production of scientific information in recent years has depended on national priorities. Almost 25 years ago the Conservation Foundation conducted an Alaskan resource study for the Department of the Interior. The report recommended that more information should be compiled on the location and extent of resources, opportunities and risks of development, and methods of arctic resources management. Nearly every Alaskan

^{1/}Pursuant to P.L. 94-258, renamed as of June 1, 1977, the National Petroleum Reserve in Alaska

Science Conference during this period recommended that an Alaskan-based center of arctic knowledge should be established. In 1967 the Federal Field Committee for Development Planning in Alaska and the President's Review Committee for Alaska (at this time mostly members of the Cabinet) endorsed this concept.

The Alaska legislature established the Arctic Environmental Information and Data Center in 1971 in response to this need. Since then, demands for reliable scientific information on Alaska's resources and environment have increased rapidly due to trans-Alaska oil pipeline construction, inventory and transfer of ownership of land and resources involved in the Alaska Native Claims Settlement Act, oil and gas leasing activity by the state and federal government on land and the outer continental shelf, and increased exploration activities in NPR 4.

Despite the recurrent myth that knowledge is lacking, a great deal is known about Alaska; however, many sources are unpublished and obscure. Collection of these often valuable data is impractical for most individual users. Although Alaska does not have a large technical library, a number of smaller specialized libraries and resource centers cooperate to avoid duplicate collections through information exchange and promotion of awareness of current projects and reports. Figure 1 shows locations of major information centers in Alaska.

INFORMATION CENTERS IN ALASKA

Major collections are at the following locations:

University of Alaska, Fairbanks--The Elmer E. Rasmuson Library houses the largest collection in the state with more than half a million books and

government documents. The Fairbanks campus publishes quarterly a computer printout of the serials of the Fairbanks campus libraries. The University is also developing a union list of serials that will list the holdings of the major libraries in the state of Alaska. Presently, a pilot project is underway involving a few of the major libraries, such as the State Library in Juneau, Loussac Library in Anchorage, and the Anchorage and Fairbanks University campus libraries. Publication is scheduled for the first of the year. The University publishes the Bibliography of Alaskana, which each month indexes periodical articles on Alaska by key word and is cumulated annually.

University of Alaska, Anchorage, Library--This library has the second largest research collection with approximately 290,000 books and government documents. Emphasis was placed on the social sciences until 1975 when the scope of the collection was broadened to include more natural science publications.

Alaska State Library, Juneau--The State Library has approximately 90,000 books and government documents, many of historical significance. Much of its service is through interlibrary loans. The Alaska Division of State Libraries and Museums publishes the Alaska Library Network Resource Directory, Alaskana Project. The 1975 publication has author, title and subject indexes to the Skinner Collection of the Elmer E. Rasmuson Library. This Division also compiled A Guide to Alaska's Newspapers in 1976.

Unique subject collections and information services are available at the following locations:

Naval Arctic Research Laboratory Library, Barrow--The "Barrow File" comprises 10 five-drawer file cabinets containing reprints of articles

written by researchers using the Laboratory's facilities and copies of interim and final reports on research supported by the Laboratory. Findings and results in some reports have never been published and are not available anywhere else.

Geophysical Institute, University of Alaska, Fairbanks--This library contains ERTS/LANDSAT imagery, U2 photos of Alaska, an archives of worldwide auroral investigations (including magnetic and color video tapes), and ice fog and climatic data.

Institute of Marine Science, University of Alaska, Fairbanks--The IMS library produces a computerized keyword in context index to its reprint file, which includes several thousand articles on marine sciences. Unpublished and uncompiled oceanographic data on Alaskan waters are in the Institute's files.

Alaska Cooperative Wildlife Unit, University of Alaska, Fairbanks--This library maintains a file of worldwide wildlife research papers with emphasis on Alaskan caribou, reindeer, bear, ptarmigan, and marine mammals.

Alaska Health Sciences Information Center, Anchorage--This center has a science subject collection which concentrates on cold weather human physiology, medicine, and arctic environmental health problems. Computer searches through the national MEDLINE system are available. This center stresses service to the Alaskan medical profession and provides telephone and mail service.

Alaska Resources Library, Anchorage--The Department of the Interior regional library emphasizes published environmental information about Alaska. This library receives copies of reports indexed in the Cold Regions Research and Engineering Laboratory's Current Literature: Cold Regions Science and Technology. (The Corps of Engineers District Library receives reports listed in the USA CRREL Technical Publications.)

Arctic Environmental Information and Data Center, University of Alaska, Anchorage--This center is a repository of unpublished reports and information and is staffed with subject analysts who are available for in-depth consultation. A referral file of people with expertise in specific subject areas provides additional depth. AEIDC indexes publications by author, title, subject and geographic area and can manually create bibliographies on demand. AEIDC maintains the only comprehensive file of Alaska weather records in the state and also serves as a source of ERTS/LANDSAT imagery for the Anchorage area. The center publishes current information on Alaskan resources and natural systems with appropriate maps and graphics and annually produces the Current Research Profile for Alaska, which documents natural resource investigations and environmental research underway in Alaska. AEIDC also operates a microfiche duplicating service for many hard-to-get Alaskan publications. Although heavily used by government agencies and consulting firms these services are also available to the general public.

Sheldon Jackson College Library, Sitka--This library contains the Andrews Collection of historical documents and photographs.

Auke Bay Fisheries Laboratory Library, National Marine Fisheries Service, Auke Bay--This laboratory has an in-depth collection of oceanographic and fisheries biology information, including published reports.

U.S. Bureau of Mines, Alaska Field Operations Center, Juneau--This center maintains a collection on Alaskan mining and mineral resources. Publications and maps are available.

U.S. Geological Survey, Public Inquiries Office, Anchorage--This office sells USGS publications and maps and maintains an extensive collection of their past publications.

Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys--This agency has a Kardex file of Alaskan mining claims. This information appears on computer listings and data sheets and provides records of all patented and unpatented mineral claims since 1953 by quadrangle, owner, and mineral. The Kardex file is available at the four Mining Information Offices in Anchorage, Fairbanks, Juneau and Ketchikan.

OTHER INFORMATION CENTERS

Other Information Centers pertinent to Alaska are:

Arctic Institute of North America, Calgary, Alberta, Canada---Founded in 1945, AINA has its headquarters and its library at the University of Calgary. The primary objective of AINA is to study arctic and cold weather conditions. The library has arctic materials in many languages, subjects, and formats. They publish the Northern Research Survey listing ongoing research and Arctic, a quarterly journal.

Boreal Institute of Northern Studies, University of Alberta, Edmonton, Alberta, Canada--This institute concentrates on the northern circumpolar area, especially Canada's North. The library has information on scientific developments (particularly conference proceedings), theses, and technical reports. The library maintains the Carl Lomen collection on Alaska. Since July 1972 the library has published Northern Titles, an index of selected English titles of northern, antarctic, and alpine articles from journals received at the institute.

U.S. Army Cold Regions Research and Engineering Laboratory Library, Hanover, New Hampshire--The library collection supports research on physics

and mechanics of cold region materials and engineering. Most of the collection is in English, but pertinent Russian information is also available. CRREL publishes technical reports, and the Library of Congress prepares the monthly announcement bulletin, Bibliography on Cold Regions Science and Technology.

Ohio State University, Institute of Polar Studies, Columbus, Ohio--The institute has a collection of approximately 7,000 items, mainly on physical and biological sciences.

Dartmouth College Library, Stefansson Collection, Hanover, New Hampshire--The Stefansson Collection has documents on the history of arctic regions through 1925 and antarctic regions through 1940 as well as other specialized areas. The library publishes the annual Polar Notes, which contains articles of general and scientific interest on polar topics.

Center for Northern Studies, Wolcott, Vermont--The center has a small northern regions collection and emphasizes the flora of Alaska and the Bering Land Bridge (Beringia). An adjacent herbarium has many plant specimens from Alaska.

University of Colorado, Institute of Arctic and Alpine Research Library, Boulder, Colorado--This environmental information library covers all alpine and arctic areas but concentrates on northern Canada and alpine Colorado. The institute publishes the quarterly journal, Arctic and Alpine Research.

Battelle Memorial Institute, Columbus, Ohio--Battelle archives a complete file of bioenvironmental information relevant to nuclear testing and its effects at Amchitka Island and the western Aleutian Islands.

U.S. Geological Survey, Technical Data Unit, Alaskan Geology Branch, Menlo Park, California--All field and research files by this unit are kept,

and copies are sent to several depositories in Alaska. A 10-year project, the Alaskan Mineral Resource Assessment Program, began in 1974 to appraise Alaska's mineral resources through mapping and aeromagnetic and geochemical analyses.

University of Washington, Fisheries Research Institute, Seattle--This institute's data files on Alaskan salmon fisheries are among the most complete. In the late 1940s and early 1950s salmon fisheries in the Prince William Sound area and southeast Alaska were emphasized, but by the mid-1950s Bristol Bay and the Kodiak-Chignik areas gained importance. This institute is the best source of information for a history of Alaskan salmon fisheries.

U.S. Forest Service, College of Forest Resources, University of Washington, Seattle---The Forest Service has an information system called the Pacific Coast Forest Research Information Network. The principal points of service are at the Forest Service Offices in Berkeley, California, and at the University of Washington. This system provides information services to forestry researchers in Alaska, Washington, Oregon, California, and Hawaii. It provides interlibrary loan services, literature searches (manual and computer), reference services, and publication of Monthly Alert (a selected listing of new acquisitions from the libraries of the information network).

National Computerized Information Systems--Some Alaskan and arctic information is stored in the computerized data bases of such information systems as NOAA's, Oceanographic and Atmospheric Scientific Information System (OASIS) and Environmental Data Index (ENDEX), EPA's, Storage and Retrieval of Data for Water Quality Control (STORET), Interior's, Water Resources Scientific Information Center (WRSIC) and Commerce's, National

Technical Information Service (NTIS). However, the quantity of arctic data included is small compared to the amount available, and there is a long delay before information is incorporated in these systems. Private computerized indexes, such as the Systems Development Corporation and the Lockheed systems contain some data bases included in OASIS but have similar limitations for retrieving Alaskan information. The Smithsonian Science Information Exchange (SSIE) indexes research funded by both federal and nonfederal sources in Alaska, but their data base is limited by their suppliers of information.

PROBLEMS IN ALASKA DATA TRANSFER

Seldom has an adequate background understanding of an Alaskan area or resource been obtained prior to development. Although not a unique situation, it has been accentuated in the Alaskan experience. Early residents of the Territory were almost all concerned with resource exploitation and there is but sketchy reference to their works. Additionally, early scientists, developers, and later, managers were most often headquartered outside Alaska, and their data usually remained outside as well. Comprehensive information was seldom available for those who remained in the North. The results of early Alaskan environmental and resource work have been scattered across the United States and, indeed, the world. Much of it is lost to today's researcher, and if it is discovered, its meaning and value are rarely recognized.

Prior to this century, scientific research was usually part of an expedition such as the 1850s investigation by Western Union of the possibility of running a telegraph cable through Canada, Alaska, Siberia and eastern Europe

to connect the United States and Europe. The effort ended abruptly when a successful trans-Atlantic link was announced, and the excellent scientific observations begun along the proposed northern route were inadequately recorded and never completed. Scientific interest in Alaska seemed to run in cycles, often determined by some totally unrelated scheme or goal. As a result, the historic record of scientific investigations in Alaska is patchy in geographic coverage, discipline, validity, accessibility, and current acceptability.

Today, amid the rush for resource information, the "expedition mentality" is still found as librarians and research technicians delve separately into the literature and the environment of the latest popular subject. Funding fluctuates, and duplication is inevitable. Each succeeding "platoon" of information seekers turns up the same readily accessible literature as the previous group and justifies it as appropriate because it was used before. The same data and published literature are recycled many times to produce "current" reports, environmental impact statements, and studies. Another problem is that job mobility and harsh climate produce a high turnover of people who take their expertise with them when they leave the state.

No completely adequate system for rapid and comprehensive data transfer exists in Alaska. This hampers district offices of state and federal agencies in their resource management tasks, industrial efforts, academic pursuits, and the public's right to know situation facts. Since the limited information resources are concentrated in Juneau, Fairbanks, and Anchorage, researchers, as well as the general public, in outlying areas are handicapped by inadequate access. Even the information flow between these three

centers is slow. In early 1976 a computer system became available state-wide to the university community, but few of the information resource centers are accessible through this system.

Information transfer between Alaska and other states is even worse. No computerized information system dealing primarily with environmental or resource information links an Alaskan entity to the lower 48, and the information in these national networks is largely unknown and inaccessible to all but a few. A reason for this situation lies in the fact that there is no time-share network for Alaska. Available telephone circuits are expensive and risky for data transfer.

Transient or new researchers in Alaska face phenomenal problems. Information sources and systems are not well known as to location, subject specialty, or documented services. Most people find out about the existence of these sources by "word of mouth." Currently, maximum efficient use cannot be made of available Alaskan data.

Other than the document depository system at the Alaska State Library in Juneau, no systematic update system exists for continuous information resource currency. Researchers are not required to file data or publications with any information system except research projects of certain federally funded programs, such as those of the National Oceanographic and Atmospheric Administration's Outer Continental Shelf Assessment Program which requires that this information be sent to the National Oceanographic Data Center. Recent and in-progress research are difficult to keep track of on certain subjects. Several services attempt to document ongoing research in Alaska: Northern Research Survey (Arctic Institute of North America), Smithsonian

Scientific Information Exchange, and the Current Research Profile for Alaska (Arctic Environmental Information and Data Center), which is the most complete.

ALASKA DATA TRANSFER--PRESENT AND FUTURE

Existing information centers in Alaska should be linked by computer system to form a master information network with information transfer, storage, and access. Each resource center would maintain its unique collections but have computer terminal access to a master listing of the others. This list could be indexed by author, title, and key words. All identified Alaskan material which is unavailable in the state should be listed and an "outside" source identified, if known. Published and unpublished Alaskan material unavailable within the state should be actively sought for inclusion in the network. Eventually, terminal access should be established into this system from every library, secondary school, and higher education unit in Alaska. Expansion of satellite stations throughout Alaska makes public communication and computer access from rural areas a realistic goal for the future.

Cooperation already exists between most of these centers through the Alaska Library Association. Several attempts at compiling a listing of statewide holdings have been made, and the statewide University of Alaska computer system makes an information network of communication terminals a possibility.

The four necessary ongoing activities to maintain such a system are:

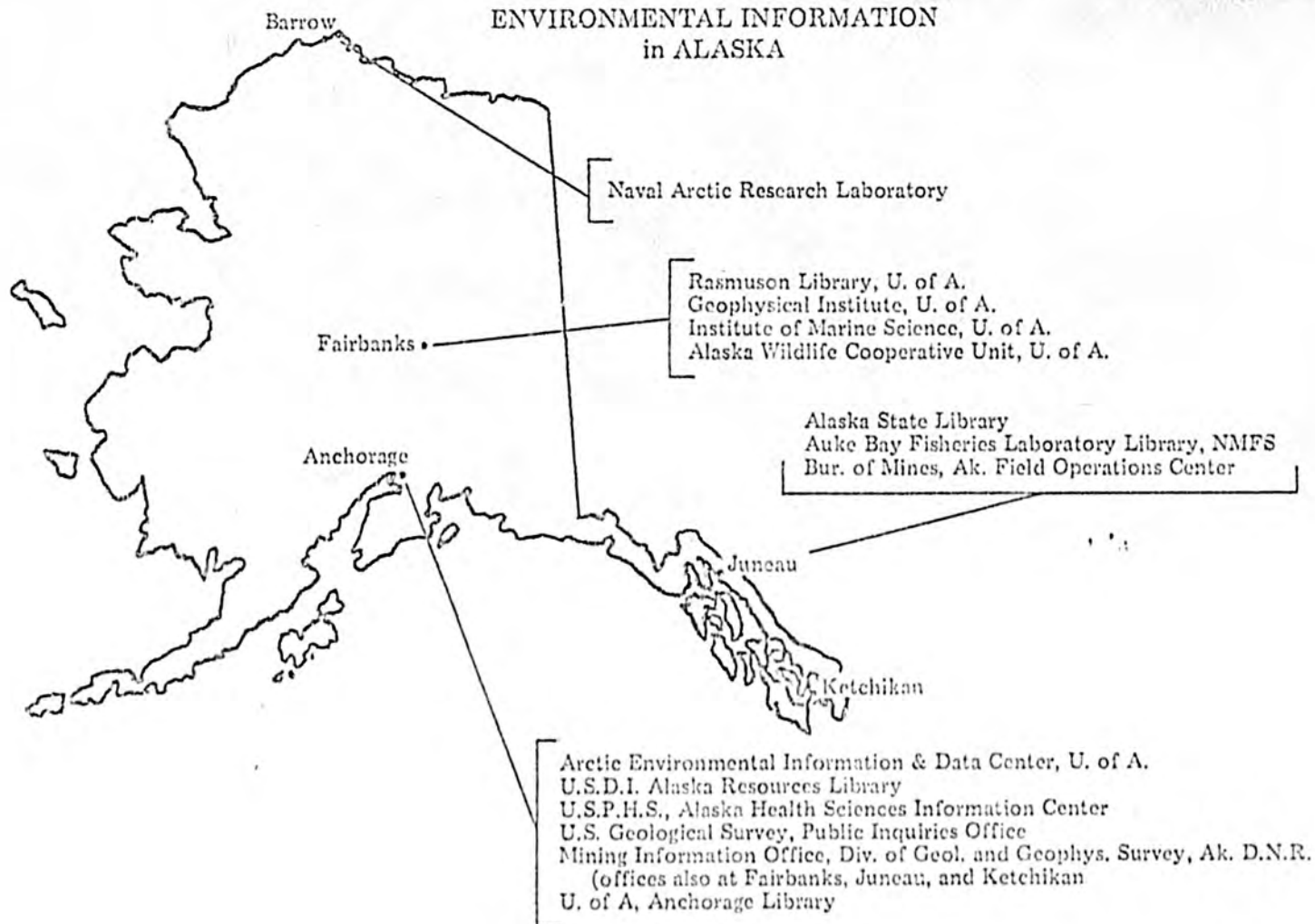
1. Mandatory archiving of all reports, studies, theses, manuscripts, publications, and other documents pertaining to Alaska by the most appropriate center in the network with submission of materials by all local, State, and Federal agencies;
2. Registration of all new research begun in or about Alaska with one designated unit in the master network;
3. Maintenance of files, identifying key individuals (inside and outside Alaska) who have expertise in a given field; and
4. Acceptance by all parties of a single coordinating organization.

Computer access must be established between the network (through one or more centers) and comprehensive or complementary national computerized information systems. This would provide access for Alaskans to broader policy, theory, and management documentation which is lacking now, and it would open a wealth of Alaskan information to individuals outside Alaska.

A monthly newsletter could acquaint potential users with the services available, new acquisitions, and general information transfer news and would automatically be mailed to registered researchers, key experts, libraries and schools in Alaska, and all local, state and federal agencies.

In summary, Alaska is the subject of extremely rapid resource and environmental decisions. The knowledge for most of these decisions either exists or is being rapidly acquired. The research, management, and information dissemination community concerned is relatively small. It is manageable. We need only to organize, fund, and operate a cooperative and efficient system.

MAJOR SOURCES
of
ENVIRONMENTAL INFORMATION
in ALASKA



ALASKA RESOURCE INFORMATION SYSTEM

(ARIS)

PREFACE

A modern state, like a modern business, must have information on all its assets, liabilities, products, and markets to be able to arrive at sound decisions that will benefit all of its "owners." The knowledge of "land and water," the State's prime assets, has become increasingly important as the state and federal governments plan to maximize the best use of these assets and try to avoid the mistakes made in other parts of the world where uncontrolled developments, unwise loss of prime agricultural lands, destruction of important wetlands, loss of fish and wildlife habitat have created irreversible disruption of land and water cycles.

State and federal agencies need a variety of information and a common data base to effectively administer various programs directed to land conservation and development. Data needs range from water resource inventory, flood control, and waste-water treatment to the need for comprehensive land use inventories of existing and changing activities on public and private lands to improve management. Federal and state agencies also need data to assess the environmental impact of the development of energy resources, to manage wildlife resources and minimize man-wildlife ecosystem conflicts, to make national summaries of

land use patterns and changes for national policy decisions, and to prepare environmental impact statements and assess future impacts on environmental quality.

Unique to most of the nation, the State of Alaska has already developed documents designed to distribute data to policy makers, scientists, and the public. The six volumes of The Alaska Regional Profiles establish the first systematic filing of maps, statistical data, and text that can be updated and refined. The Profiles were based on information on the physical and biological environments compiled by the Resources Planning Team of the Joint State-Federal Land Use Planning Commission in the first phase of its operations. These data were refined, correlated, updated, and published by the staff of the University of Alaska's Arctic Environmental Information and Data Center, which was established by the Alaska legislature in 1971 to assist in the retrieval and distribution of data related to land and water use.

The Profiles have already been used extensively by Federal and State agencies, and members of Congress as they gather the facts needed to determine policy for management, tenure, and use of Alaska's land and resources. Even greater use can be expected when Congress reconvenes with new members to consider these issues. The importance of providing these data to those who will make these determinations cannot be over-emphasized. The detailed maps in the Profiles graphically illustrate the complexities and variety in the natural and man-made systems in Alaska, and they provide a concrete, factual framework on which to base a permanent retrieval data system.

One of the major justifications for funding of the Profile series was that it would develop a permanent method of data retrieval and updating and would provide the experience to make recommendations directed to establishing the most effective system to accomplish this task. We believe that the state and federal governments will receive the greatest benefit from their investment in the Profiles by developing an automated filing system which can input new data, update existing data, manipulate the data, retrieve the data quickly, and provide new information in a variety of formats for the maximum amount of users and topics. Such an interagency data collection system of retrieval, storage, and publication could become a model for the rest of the country.

Justification

The need for coordinated land use planning by informed decision makers has become imperative. Land use planning, natural resource management, and environmental control are among the most important national issues. The pressures of expanding population, urban growth, shrinking energy supplies, and environmental deterioration have brought the public to the realization that we must carefully plan for the wise use and optimum development of our land and natural resources. The establishment of new agencies to deal with environmental protection and energy crisis along with the introduction of legislation directed to minimize adverse environmental impacts reflects these concerns at a national level. State and local governments have enacted legislation dealing with development controls and systematic land use planning. Industry has responded by developing new techniques and tools to comply with new regulations and solve some of the problems created by past neglect or expediency.

To develop a natural resource policy or strategy for the balanced conservation and development of natural resources decision makers must have ready access to current and meaningful natural resources data. Most of the necessary data exist but they are often widely scattered among many agencies which have never standardized the type of data collected, the scale of maps used, the format of data presented, geographical reporting region, and frequency of updating. Consequently, data generated by one agency is frequently unknown or unusable by another, which, results in confusion, unnecessary duplication of effort, and unnecessary cost for the taxpayer.

A single integrated information system that is flexible enough to permit manipulation and display of a wide variety of data in many formats for various users would eliminate much of this waste.

Benefits

The immense amounts of data required to develop and manage land use plans can no longer be simply and manually controlled. For many federal and state organizations, the problems of data distribution have reached unmanageable proportions. For example, the Federal-State Land Use Planning Commission, with responsibilities for identification of and recommendations concerning the uses of lands in federal ownership, faces a tremendous challenge. To conserve where necessary, to develop where practical, and to offer knowledgeable leadership and cooperation with private and public interests require knowledge and responsible judgement.

The proposed Alaska Resource Information System (ARIS), is designed to aid various Federal and State agencies and private interest decision makers in land use planning and management.

The initial step in developing a management oriented system requires an in-depth understanding of specific problems confronting the Federal-State Land Use Planning Commission management. A preliminary outline of goals, policies, development direction, limitations, and potentials has been developed to channel this effort toward the most productive results. This outline will undoubtedly undergo modifications and refinements as Phase I work uncovers new factors to be considered. Nevertheless, a working framework has been designed to govern and direct the ongoing program of developing the appropriate and necessary tools for the Federal-

State Land Use Planning Commission to better manage its responsibilities. The Commission supported the preparation of the Profile series as a summary of the data base needed for planning.

The next step to make this unique resource information repository current and accessible to the maximum amount of users is to develop an automated filing system. The correlation of maps in the Profiles will provide a framework for evaluating the interrelationships between various resources and the effect of climate, soils, topography, and other factors that affect development in Alaska. A computer system could provide accurate, detailed information rapidly, and data could be easily updated.

Objectives

Alaska is a logical testing ground for the development of an interagency (state-federal) computer-based information system designed to aid resource development and land use planning. Land use, development, and management decisions are of such large magnitude that they demand the most innovative methods and approaches.

This project has the following goals:

1. To provide a computer retrievable file of all natural resources data (including mineral occurrences of potential economic significance).
2. To make available data to all users on Alaska resources that are now largely inaccessible.
3. To prevent the duplication of cost in data gathering retrieval and distribution that is presently causing a sizeable drain on the various agency budgets.
4. To identify needs for additional data and refinement of available data.
5. To obtain needed information on the technology, costs, and manpower requirements for the development of a permanent computer-based natural resource information system.
6. To test user acceptance of the new approaches to continuing information as well as to seek answers to questions concerning security and availability to computer-stored data.

Implementation Plan

The approach is presented as a three phase structure developed under the coordination of the Federal State Land Use Planning Commission for the first two years, and directed by the user's and technical committee, (See Figure 1.). The value of such a development philosophy is that the basic organizational structure of the system can be established along with a basic level of service which documents the utility of the overall approach and thereby encourages voluntary cooperation. The major elements of the proposed phases are as follows:

o Phase I - First year

- Research coordination
- Reference and referral service
- Publication of sources
- Computerized mapping demonstration with remote sensing
- Users' and Technical committee
- Monitor use of service

o Phase II - Second year

- All of Phase I
- Formal procedures for cooperation
- Compatible data definitions, classifications, etc.
- Computerized resource information system
- Map updating process
- Monitor use of services

o Phase III - each year thereafter

- All of Phase II
- Operation and maintenance of the resource information system center
- Monitor resource information
- Record management activities

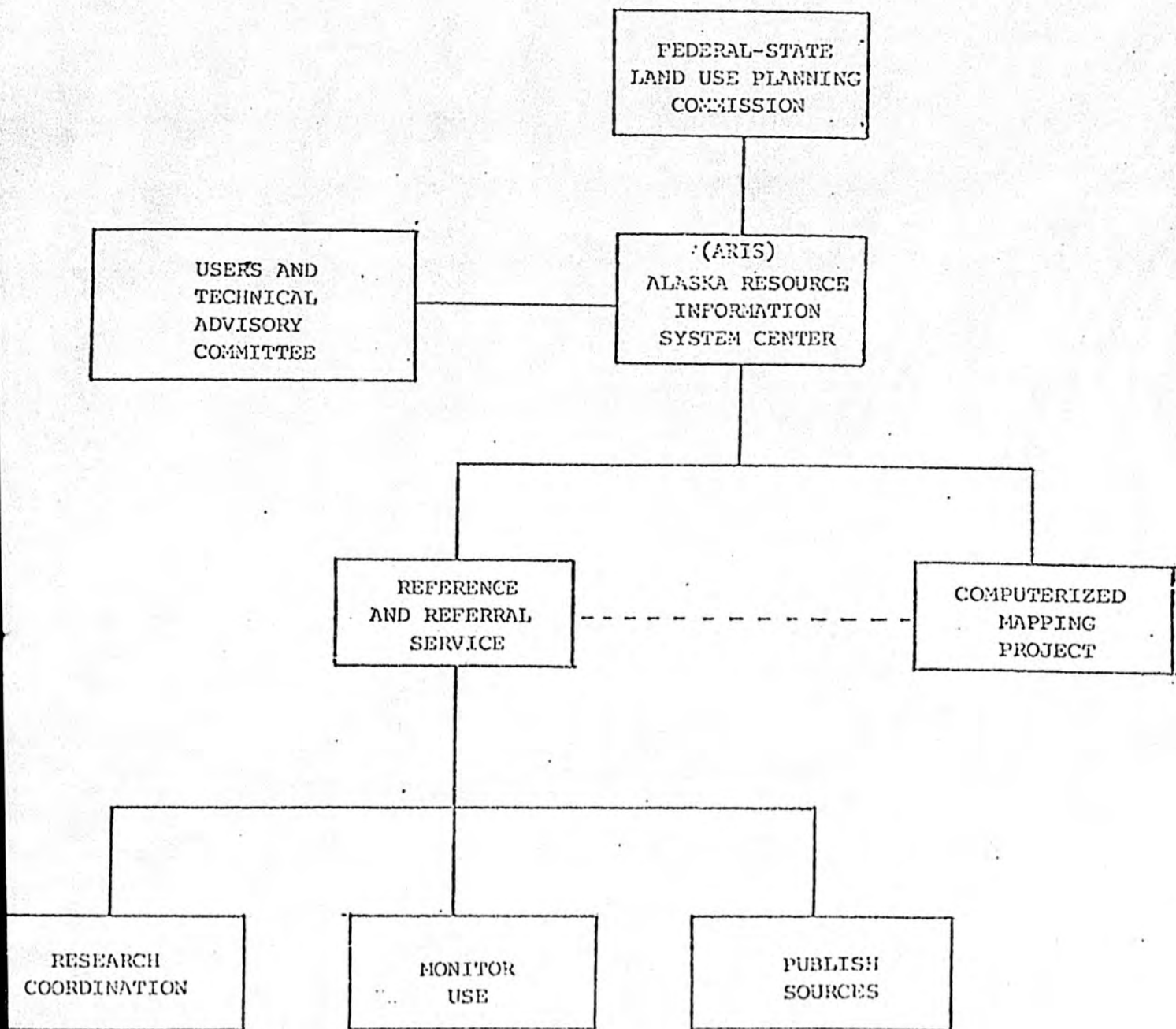


Figure 1. PHASE I AND PHASE II Operational Structure

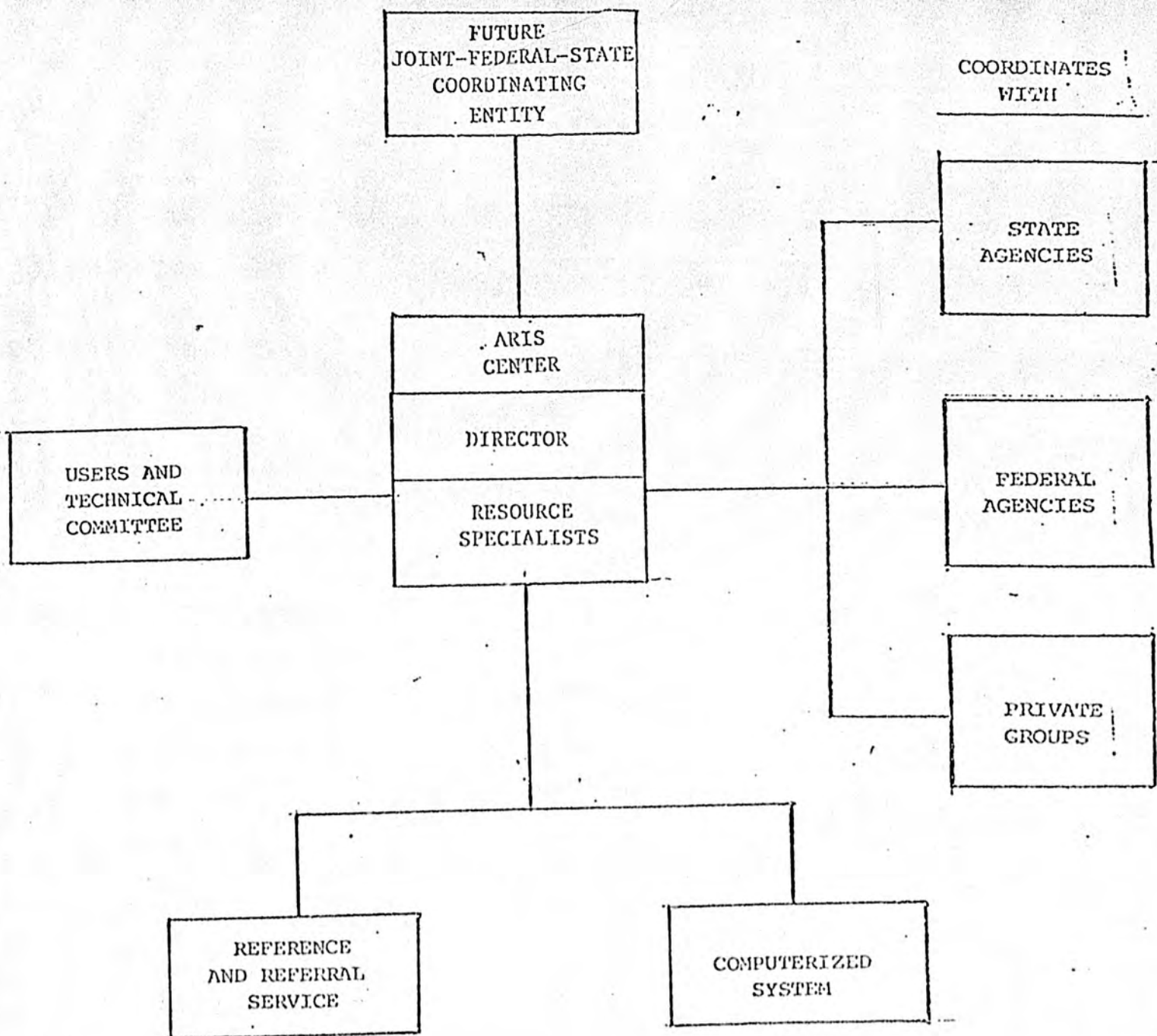


Figure 4. PHASE III - Operational Structure of the
Alaska Resource Information System Center

Conclusions

- o The statewide resource information system would be assigned to the Federal-State Land Use Planning Commission for the development of phases. Phase III would be assigned to a newly created joint Federal-State entity (see Fig. 4).
- o The system would be operated by a separate and distinct organization within the commission initially.
- o The system must be a mandated function in order to serve high priority support of associated agencies.
- o The system would be developed in stages to test the approach and to encourage voluntary cooperation
- o The demonstration project for the mapping system would be conducted before a commitment is made to a complete statewide resource information system
- o A major effort to utilize existing data and to coordinate research must be developed in a reference and referral service
- o Definitive land management policies, objectives, and programs would guide the development of the statewide system.

Cost of developing an Alaska Resource Information Center: (see Appendix A for detailed implementation plans)

Phase I - First year budget

o Reference and referral service	\$ 250,000
o Computerized mapping demonstration	<u>150,000</u>
Total:	\$ 400,000

Phase II - 2nd Year Budget

o Continuation of Phase I activities	\$ 300,000
o Design and develop a statewide resource information system	<u>700,000</u>
Total:	\$1,000,000

Phase III - Each year thereafter

- o Operation and maintenance of the computerized resource information system center for the State of Alaska including the updating of the data base and dissemination of information.

Total: \$1,500,000

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AS A UNIT IN THE ORIGINAL DOCUMENT.



UNIVERSITY OF ALASKA

February 21, 1977

Hon. Hugh Malone
Speaker
State House of Representatives
State of Alaska
Pouch V
Juneau, AK 99811

Dear Hugh:

This letter is to suggest to you the scheduling of an oversight hearing by the Resource Committees of the Senate and House on the current operations and future directions of the Arctic Environmental Information and Data Center (AEIDC).

I make this suggestion since it was the resources Committees of the legislature with the support of then House Speaker Gene Guess and Senate President Jay Hammond who created AEIDC in 1972, as a central focus for Alaskan environmental and natural resource information analysis, synthesis and dissemination. During the five years of our existence we have achieved the distinction of being the only viable information center of its kind in the Nation. In fact, several proposals exist to emulate our operation elsewhere in the country to act as other centers of information analysis, synthesis and dissemination on coastal zone, outer continental shelf, natural resource and land use planning matters. Our operations, however, despite several apparent successes and national recognition, are beset by a number of policy problems for which I feel the need of legislative guidance.

Listed below for initial consideration and discussion are ten basic policy questions which trouble the administration of AEIDC. Each policy question is followed by a brief summary background statement.

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February 21, 1977

1. What is the clientele to be served by AEIDC?

BACKGROUND

In 1976, AEIDC responded to approximately 12,500 requests for environmental and natural resource information and program advice. Of these, about one-third came from state agencies, one-third from federal agencies and the remaining one-third from a large variety of consultant firms, Alaskan industries, public interest groups, Native corporations, educators and the general public. The Center also engages in contract services; in 1976, 67% of the contractual effort was in support of state requests, 21% for federal agencies, 12% for private organizations (primarily oil industry and Native groups).

2. Should AEIDC render free services and/or enter into contractual arrangements with all users of its services equally?

BACKGROUND

In 1976, AEIDC's response to inquiries and requests for advisory services required the dedication of 12,564 man hours, or a little over six man years, of non-reimbursed effort. Additionally, the Center performed twenty-nine contractual tasks for state and federal agencies, Native corporations and private industry. All inquiries or contractual requests are treated equally regardless of source. For much of the information sought, AEIDC is the only source available. Because of budgetary and staff limitations, we need to know the sense of the legislature regarding priorities of both free and contractual services.

3. Should AEIDC establish a formal user charge program beyond present levels?

BACKGROUND

Presently AEIDC only charges inquirors for duplication of materials such as maps, reports, microfiche, etc., on an actual cost basis. Staff time for such duplication is not charged.

4. What should be the proper relationship between AEIDC and governmental agencies? Should AEIDC administratively or the legislature by law, establish long-range terms of reference between AEIDC and local, state or federal agencies for AEIDC's information services?

BACKGROUND

All AEIDC governmental relationships are either through the furnishing of free services responding to requests for information or program advice or pursuant to relatively short-range contracts for specific tasks. A question for consideration is whether government agencies and/or AEIDC could be more efficiently served by long-term agreements under legislatively established guidelines.

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February 21, 1977

5. Should a special informational service relationship between AEIDC and the Joint Federal-State Land Use Planning Commission be established?

BACKGROUND

AEIDC has had a particularly special relationship with the F-SLUPC in the furnishing of information for the Commission decision processes. However, this relationship has been generally informal except for contractual tasks. Resource and land use planning depends upon a dynamic process of factual application. As a future role for the Commission or its successor evolves, should AEIDC be formally identified as a central information service for the Commission.

6. What should the long-range continuing administrative relationship of AEIDC be with the University of Alaska?

Alternatives:

- a. An administrative function of the U of A Anchorage or Fairbanks;
- b. An administrative function of the President's office;
- c. Administration through a State-University foundation.

BACKGROUND

AEIDC operates its informational service and scientific program on a statewide basis. When first established, the Director of AEIDC reported to the Vice President for Research in the Office of the President. University reorganization in 1976 resulted in organizational cognizance of AEIDC being vested with the Fairbanks campus Chancellor until such time as research management competence was developed in Anchorage. Neither arrangement (i.e. reporting to regional campus Chancellors in Anchorage or Fairbanks) seems adequate for the administration and direction of statewide programs.

7. Should the environmental science and natural resource functions of AEIDC be expanded to include socio-economics and public land, resource and environmental law under a new aegis as an "applied" science center or institute?

BACKGROUND

Analysis or synthesis of natural resource, land use and environmental issues is never complete unless knowledge of biology and physical sciences and resources is correlated with the social and economic value systems of man and the framework of laws established by man. AEIDC has sometimes utilized the services of the Institute of Social and Economic Research and other economic and legal sources of expertise in preparing particular reports. In future terms of reference, however, consideration of a formal structure combining natural science and resource specialists with individuals well versed in the social, economic and legal fields deserves some thought.